DOCUMENT RESUME

ED 156 800 UD 018 448

AUTHOR	Lord, J. Dennis
TITLE	Spatial Perspectives on School Desegregation and Busing. Resource Papers for College Geography No. 77-3.
INSTITUTION	Association of American Geographers, Washington, D.C. Commission on College Geography.
PUB DATE	77
NOTE	43p.; Not available in hard copy due to institutional restriction
AVAILABLE FROM	Association of American Geographers, 1710 Sixteenth Street, N.W., Washington, D.C. 20009
EDRS PRICE	MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	*Bus Transportation; Case Studies; Elementary Secondary Education; Geographic Regions; Geography; *Human Geography; *Integration Effects; *Integration Methods; Integration Plans; Political Issues; *School Integration; Urban to Suburban Migration
IDENTIFIERS	Massachusetts (Boston); Michigan (Pontiac); North Carolina (Charlotte); Virginia (Richmond)

ABSTRACT

Concepts and methods of geography are applied to the study of school desegregation in this paper. Beginning with a spatial/temporal view of desegregation, the key legal events which have charted the course of desegregation are reviewed, and geographic patterns over time are examined. This discussion is followed by an investigation of the determinants of these patterns, especially in the southern United States. Desegregation is viewed as a spatial diffusion process in which certain factors have strengthened white resistance, thereby functioning as barriers to the diffusion. Brief case studies of the desegregation and busing experiences in Charlotte-Mecklenburg, North Carolina, Richmond, Virginia, Pontiac, Michigan, and Boston, Massachusetts are presented. The case studies are followed by an examination of the relationships between urban spatial organization, particularly residential segregation, and the school desegregation issue. Desegregation techniques are reviewed, including the applicability of spatial allocation models in the design of school integration plans. In conclusion, some far reaching political and demographic impacts of desegregation and busing are examined. Suggestions are offered for using this paper in geography or social studies classrooms. (Author/GC)

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SPATIAL PERSPECTIVES ON SCHOOL DESEGREGATION AND BUSING

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RESOURCE PAPERS FOR COLLEGE GEOGRAPHY
NO. 77-3

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1710 Sixteenth Street, N.W.
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Library of Congress Card Number 76-57034
ISBN 0-89291-124-7

FOREWORD

In 1968, the Commission on College Geography of the Association of American Geographers published its first Resource Paper, *Theories of Urban Location*, by Brian J. L. Berry. In 1974, coinciding with the termination of NSF funding for the Commission, Resource Paper number 28 appeared, *The Underdevelopment and Modernization of the Third World*, by Anthony R. deSouza and Philip W. Porter. Of the many CCG activities, the Resource Papers Series became an effective means for permitting both teachers and students to keep abreast of developments in the field.

Because of the popularity and usefulness of the Resource Papers, the AAG applied for and received a two-year grant from NSF to continue to produce Resource Papers and to put the series on a self-supporting basis. The 1977 Series is the first group produced entirely with AAG funding.

In an effort to increase the utility of these papers, the Resource Papers Panel has attempted to be particularly sensitive to the currency of materials for undergraduate geography courses and to the writing style of these papers. The present Panel continues to affirm the original purposes of the Series, which are quoted below:

> The Resource Papers have been developed as expository documents for the use of both the student and the instructor. They are experimental in that they are designed to supplement existing texts and to fill a gap between significant research in American geography and readily accessible materials. The papers are concerned with important concepts or topics in modern geography and focus on one of three general themes: geographic theory; policy implications; or contemporary social relevance. They are designed to complement a variety of undergraduate college geography courses at the introductory and advanced level.

The Resource Papers are developed, printed, and distributed under the auspices of the Association of American Geographers. The ideas presented in these papers do not imply endorsement by the AAG.

Many individuals have assisted in producing these Resource Papers, and we wish to acknowledge those who assisted the Panel in reviewing the authors' prospectuses, in reading and commenting on the various drafts, and in making helpful suggestions. The Panel also acknowledges the perceptive suggestions and editorial assistance of Jane F. Castner of the AAG Central Office.

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SUGGESTIONS FOR CLASS USE

This resource paper could be used effectively as a supplement to textbooks for courses in introductory human-social geography, urban geography, and political geography. Also, the topic might be used as a unit of study in more specialized courses or seminars that focus on current urban and societal issues. Since the topic is one that crosses many social science disciplines, including sociology, political science, educational psychology, as well as geography, the material could be used in interdisciplinary courses. Perhaps an entire seminar could be developed around the topic of school desegregation, incorporating the perspectives of social scientists from several disciplines. This paper also might be used in classes on educational planning for school administrators.

The author has used a spatial allocation model similar to the one presented in this paper in classroom exercises. If a computer program is available which solves the transportation problem of linear programming, it will facilitate using such a model. Students can change the constraints of the desegregation plan and note the consequences of such changes. Even without a computer program, one could create a hypothetical school district with a given distribution of students and location of schools and have students design a desegregation plan. The class can obtain some interesting results if it is divided into two or more groups with each group given a different objective for its desegregation plan. For example, one group could be asked to design a plan that would maintain segregated schools (the segregationists), while a second group could be asked to design a plan that would fully desegregate schools (the integrationists). The two groups might present their respective plans, discuss the differences, and attempt to arrive at some compromise solution. In this classroom simulation, it could be made clear to the two groups that if a compromise solution is not reached, an arbitrator (such as the courts) will impose a solution which may well contain features not desired by either group.

Students might also be asked to develop brief scenarios for the school desegregation experiences of their local districts similar to those cases presented in Chapter Three. These scenarios might contain the most relevant facts about the desegregation experiences and could include information pertaining to the type of desegregation plan used, citizen reactions, and enrollment trends.

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I. INTRODUCTION

Racial segregation in our society is not only a product of educational policies but also the result of social forces and past governmental actions. The burden has fallen upon the schools to correct social inequities that have resulted from this segregation. The question may be posed: "Has too much of the burden for social change been placed upon the yellow school bus?" School desegregation has not been able to solve the nation's racial problems. Schools cannot and should not be the sole agents for social change.

Although many schools and school districts have achieved racial balancing, it has not been achieved to the same extent in other aspects of our society. And even though schools may be physically desegregated, individual classrooms and various school activities often remain segregated. Truly integrated education is not yet a reality. Lowry (1973) has suggested that the trend toward the full integration of our society will not "take off" under its own momentum until major fundamental changes occur such as the demise of residential segregation.

The issues of school desegregation and busing have presented a paradox of sorts in terms of individual freedoms. In one perspective they represent the imposition of governmental controls in order to equalize individual control. They have not only been motivated by but also present a challenge to the idea that individuals have certain rights to control their own social environment and that of their children (Jackson and Mendelson, 1975). Desegregation and busing have been necessary in order for blacks to have this right, yet many whites view these actions as taking away their rights to do the same.

Despite the importance and timeliness of school desegregation and busing issues, they remain topics that relatively few geographers have examined despite the many obvious spatial dimensions of the issues. In contrast, much of the research on these topics, even that which incorporates a spatial viewpoint, has been conducted by other social scientists, especially sociologists and political scientists. It is hoped that this resource paper will contribute to filling this void and enhance the understanding of those aspects of school desegregation and busing that can be examined from a spatial perspective. As such, this resource paper represents applying geography to an area of important societal concern. Also this paper should be a useful contribution to the undeveloped field of the geography of education (Hones and Ryba, 1972).

The paper begins with a spatio-temporal view of desegregation. First, it reviews the key legal events which have charted the course of desegregation then it examines geographic patterns over time in desegregation activity. Much of this analysis focuses on the southeastern United States where *de jure* segregation had existed prior to the landmark *Brown* decision (Brown, 1954). The description of the geographic patterns of desegregation progress is followed by an investigation of the correlates or determinants of these patterns. One can view desegregation as a spatial diffusion process in which certain factors have acted to strengthen white resistance and thereby have functioned as barriers to the diffusion.

Brief case studies are presented of the desegregation and busing experiences in four urban school districts (Charlotte, Richmond, Pontiac, and Boston) which have been in the news during recent years. These case studies focus upon such things as the type of desegregation plan used, citizen reactions, and the efficacy of desegregation policy.

Next we examine the relationships between several aspects of urban spatial organization and the school desegregation issue. Topics discussed include residential segregation, central city to suburb migration, population density patterns, and school locations. Particular emphasis is given to the relevance of residential segregation to school desegregation. Desegregation techniques are reviewed, including the applicability of spatial allocation models in the design of school desegregation plans. These models can be used to illustrate the significance to busing costs of such conditions as required racial ratios in schools, school capacity constraints, and the location of schools relative to the residential distribution of students.

The last section of the paper examines some political and demographic impacts of school desegregation and busing. The political impact has been both local and national. It is pointed out that desegregation has had an impact which has spilled over to other issues, such as the effect on voters' attitudes toward various referenda items. Lastly, we will investigate the impact of desegregation and busing on "white flight." This has been a topic of great interest in recent years and is one where strong disagreements currently exist among social scientists. Certainly the impact on white flight has important consequences as to the efficacy of desegregation policy.

II. TEMPORAL AND SPATIAL ASPECTS OF SCHOOL DESEGREGATION

Chronology of Key Legal Events

An appropriate beginning point for examining school desegregation in the United States is a review of the major judicial and legislative decisions that have had a significant impact on the course of desegregation activity. Figure 1 portrays a chronological sequence of selected major legal events. Each event represents the end or beginning of a new phase in the history of school desegregation.

Many court decisions related to school desegregation have incorporated important spatial components. These decisions use geographic language such as school locations, residential patterns, neighborhoods, and distance.

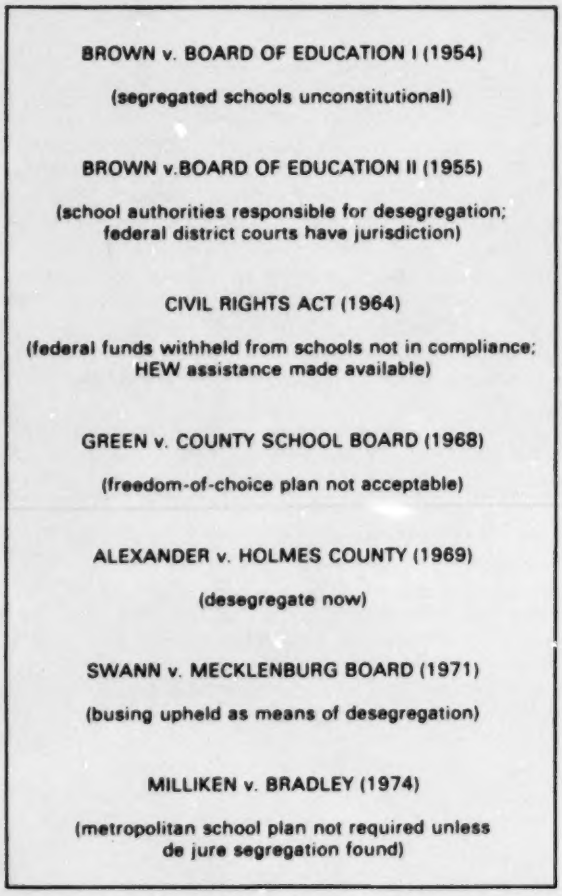
BROWN v. BOARD OF EDUCATION I (1954)
(segregated schools unconstitutional)
BROWN v.BOARD OF EDUCATION II (1955)
(school authorities responsible for desegregation; federal district courts have jurisdiction)
CIVIL RIGHTS ACT (1964)
(federal funds withheld from schools not in compliance; HEW assistance made available)
GREEN v. COUNTY SCHOOL BOARD (1968)
(freedom-of-choice plan not acceptable)
ALEXANDER v. HOLMES COUNTY (1969)
(desegregate now)
SWANN v. MECKLENBURG BOARD (1971)
(busing upheld as means of desegregation)
MILLIKEN v. BRADLEY (1974)
(metropolitan school plan not required unless de jure segregation found)

Figure 1. Key Legal Events in School Desegregation.

In several instances the courts have cited as an example of *de jure* segregation situations whereby school officials have selected "locations" for new schools to maintain segregation. Also, the plaintiffs in the cases have come from specific geographic settings, many of which have been in the South. In fact, an examination of the spatial components of the court decisions would make an interesting study in itself.

Brown v. Board I and II

The *Brown I* decision (Brown, 1954) came at a time when *de jure* segregated schools (i.e., segregation by law or official action as contrasted with *de facto* segregation, segregation in fact) existed throughout the southeastern United States. Figure 2 indicates the location of states which had laws requiring segregated public schools at the time of this decision. This list included a total of seventeen southern and border states. Four additional states, Arizona, Kansas, New Mexico, and Wyoming, allowed local forms of segregation in schools. The remaining twenty-seven states consisted of sixteen where laws specifically prohibited segregation, and eleven others which had no laws on the subject but where schools were open to all races.

Argument was first heard in the *Brown* case in 1952 and was followed in 1954 by the Supreme Court decision. The plaintiffs from the states of Kansas, South Carolina, Virginia, and Delaware argued that segregated public schools were not equal, could not be made so, and thus such schools deprived them of equal protection of the laws. The Court thus addressed the question of whether schools segregated on the basis of race, even though these schools were equal in terms of physical facilities and other factors, deprived the children of the minority race of equal educational opportunities. The Court's answer was yes, and it supported this conclusion by stating that separating the minority group from other students of similar age simply because of race would generate a feeling of inferiority, and that such separation would deprive blacks of some of the benefits they would receive from an integrated education. The Court ruled that separate educational facilities were inherently unequal, and that the plaintiffs were deprived of the equal protection of the laws as guaranteed by the Fourteenth Amendment. The decision also represented an affirmation of the principle that national rights superseded state rights.

The question of appropriate relief was not considered in *Brown I* because of the wide applicability of the decision and the great variety of local conditions. The

formulation of decrees became the next order of business, and after further argument the Court handed down a second decision in 1955, *Brown v. Board II* (Brown, 1955). This decision addressed the manner in which school systems were to accomplish desegregation, i.e., the method of dismantling dual school systems. Local school authorities were given responsibility for compliance with *Brown I*. Also, the Court assigned federal district courts the task of determining whether or not actions by school authorities represented good faith implementation of the governing constitutional principles. These courts were to consider the adequacy of any desegregation plans devised by school authorities for the purpose of effectuating a racially nondiscriminatory system.

Civil Rights Act of 1964

The desegregation of public schools made very little progress during the decade following the two *Brown* decisions. Thus by the mid-1960's racially segregated schools still persisted, despite the Supreme Court requirement in the *Brown II* decision that school desegregation proceed "with all deliberate speed." The problem was that although blacks in the South had accentuated the word "speed," whites, on the other hand, accentuated the word "deliberate" (Read, 1975).

The 1964 Civil Rights Act gave an additional impetus to desegregation. Because of the lack of progress in school desegregation, Congress had included provisions in this legislation to deal with the problem. One provision involved the authorized cutoff of federal funds to school districts that were not in compliance with desegregation guidelines. The Department of Health, Education, and Welfare (HEW) also established desegregation standards by which school systems could remain qualified for federal funds. HEW cited "freedom-of-choice" plans as being acceptable if such plans proved effective in desegregation. Many systems adopted the freedom-of-choice approach after 1964 with full knowledge that such an approach could not effectuate a desegregated system. Also, HEW offered assistance to school systems in devising acceptable desegregation plans. Although this legislation did have the effect of bringing about desegregation in many small school systems in the South during the mid- and late 1960's, its effect on large urban school systems was minimal.

Green v. County School Board

The Supreme Court decision in the *Green* case (Green, 1968), along with its decision the following year in *Alexander* (Alexander, 1969), marked the beginning of a new phase in school desegregation history. The *Green* suit was originally filed in 1965 in response to the existence of a segregated school system in rural New Kent County, Virginia. In order to remain eligible for federal funds, the school board of New Kent County had implemented in 1965 a freedom-of-choice plan for desegregating its two schools, Watkins and New Kent. For three

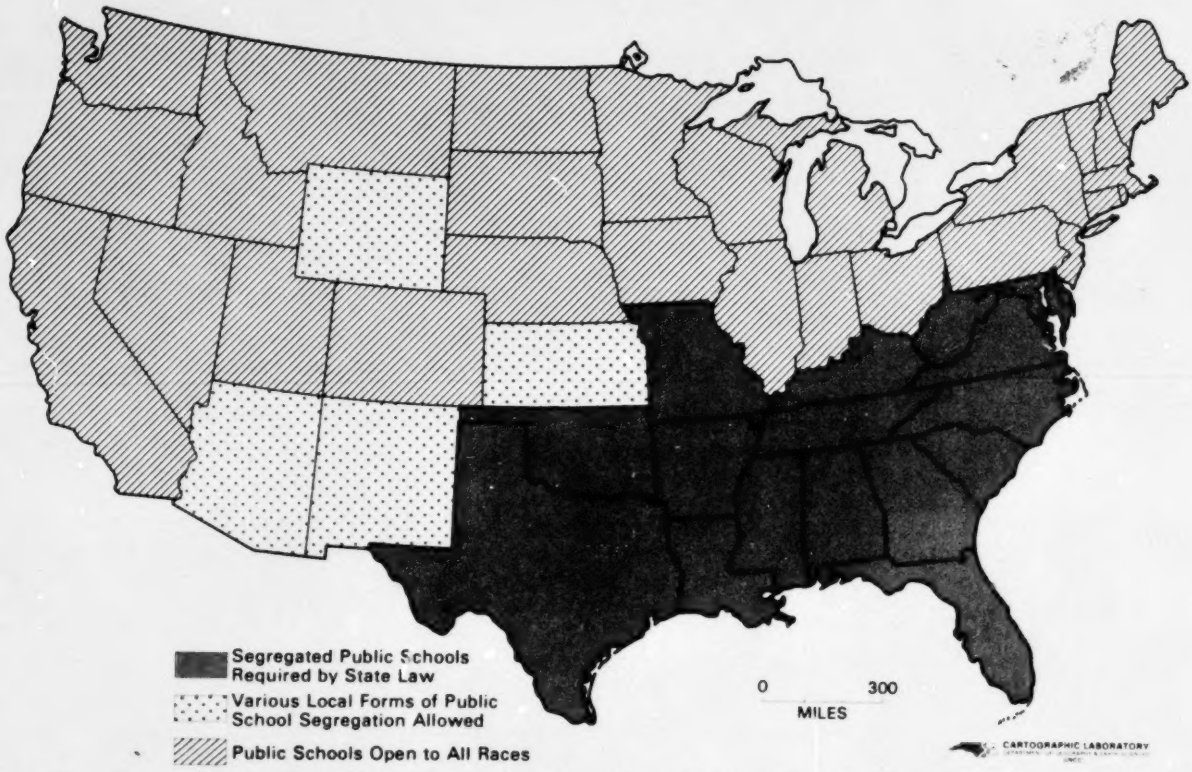

Figure 2. Location of *De Jure* School Segregation Prior to *Brown* Decision (Source: Adapted from Ashmore, 1954.)

years under this freedom-of-choice plan no white student chose to attend black Watkins school, whereas eighty-five percent of the black students remained at Watkins—thus leaving New Kent a predominantly white school.

The Supreme Court saw as its task in the 1968 *Green* case the evaluation of the effectiveness of New Kent County's freedom-of-choice plan in achieving a racially nondiscriminatory school system as had been ordered in *Brown II*. The Court held that it was the burden of the school board to provide a plan that promised to work *now*. While recognizing the acceptability of a freedom-of-choice plan that offered a real possibility of achieving a unitary, nonracial system, the Court went on to say that when other means are reasonably available which promise a speedier conversion to a unitary system, then the freedom-of-choice plan is not acceptable. In New Kent County, as in many other systems, other means were available, such as redrawing attendance area boundaries which would have led to a much speedier conversion. The Court ruled that the New Kent County freedom-of-choice plan was not acceptable thus setting the stage in many school systems for the demise of freedom-of-choice as an acceptable desegregation technique.

Alexander v. Holmes

The case of *Alexander v. Holmes* brought an end to the use of ineffective freedom-of-choice or free-transfer plans which had existed in many school districts (Alexander, 1969). The era of "all deliberate speed" ended with the *Alexander* case. The Court ruled that the continued operation of racially segregated schools under the standard of "all deliberate speed" was no longer constitutionally permissible, and that school districts were to operate unitary systems. The *Alexander* case had involved desegregation plans of thirty-three Mississippi school districts.

Swann v. Charlotte-Mecklenburg

The Charlotte-Mecklenburg, North Carolina school district was the site of one of the best known and most often quoted Supreme Court school desegregation cases. Although the *Swann* decision (Swann, 1971) is perhaps best known as the case upholding busing as an acceptable tool for school desegregation, the case addressed several other important questions: (1) to what extent may racial balance or racial quotas be used to correct a segregated system; (2) must every all black or all white school be eliminated in the desegregation process; (3) can there be any limitations on the rearrangement of school districts and attendance zones; and (4) can there by any limitations on the use of transportation facilities (i.e., buses) to correct racial school segregation?

The Court held that such techniques as the pairing and grouping of schools were permissible tools of desegregation (these techniques are discussed in Chapter Four). In addressing the issue of bus transportation, the Court noted that large numbers of students were already riding buses in such school systems as Mobile and Charlotte prior to desegregation, and that it would be impossible to dismantle dual systems without bus transportation. The Court concluded that desegregation plans could not be limited to walk-in schools and that school authorities would have to use bus transportation for desegregation.

Milliken v. Bradley

A question that emerged during the early 1970's, and one with important spatial implications, concerned whether or not boundaries such as school districts were a sufficient reason for maintaining segregated public school systems. The question surfaced as several central cities had become predominantly black largely because of white suburbanization. Notable examples included Detroit, Richmond, and Louisville. Supporters of desegregation argued that if desegregation could not be accomplished within a single school district, then the desegregation plan should involve a much larger area, i.e., areas lying beyond existing school district boundaries.

The first court case related to a metropolitan desegregation plan was that of the Richmond, Virginia city school system. The federal district court judge ordered the merging of three school districts, including Richmond City, Henrico County, and Chesterfield County. The court of appeals later reversed the federal district court decision, ruling that all state-imposed desegregation had been removed in the Richmond schools and thus no further intervention by the federal court was necessary. The court of appeals ruling was then appealed to the U.S. Supreme Court, and in 1973 the Court reached a four-four deadlock which had the effect of upholding the court of appeals decision (Bradley, 1973). In the following year the Supreme Court in *Milliken v. Bradley* ruled that courts did not have the right to require the implementation of a metropolitan-wide desegregation plan in Detroit because evidence was not shown of state-imposed segregation practices in the surrounding school districts (Milliken, 1974). Because such practices were shown to exist, a metropolitan desegregation plan was implemented in Louisville in September 1975. A similar plan has been ordered for Wilmington, Delaware.

Regional Patterns of School Segregation-Desegregation

De Jure Segregation

For more than fifteen years after the *Brown* decision the courts and the federal government focused much of their desegregation activity on the southern and border states where *de jure* segregation had existed prior to *Brown* (see Figure 2). Thus the location of pre-*Brown de jure* segregation determined the spatial patterns of the enforcement of desegregation law for almost two decades. The focus of desegregation activity upon this region was later reemphasized by the *Jefferson* cases (*United States v. Jefferson*, 1966, 1967). These cases mandated the use of HEW guidelines in the preparation

of desegregation plans. The opinions in the cases were carefully restricted to *de jure* segregation conditions and thus aided in fostering a distinction used in the late 1960's and early 1970's to justify differential treatment for the South and North. Not only was the desegregation emphasis on the South during the first ten to fifteen years after *Brown* but also this was the case for the period of the late 1960's and early 1970's when large-scale desegregation occurred in southern school districts without comparable change in northern areas. *Swann* further emphasized the *de jure* segregation distinction, where the opinion was stated as applying only to school systems with a background of *de jure* segregation.

Segregation Patterns in the South, 1954–1964

The Southern Education Reporting Service (1967) has been the principal source of information on school desegregation activity in the southern and border states. (For the definition of southern and border states as used in this paper see Table 1.) Before proceeding to analyze the pattern of the desegregation progress for the period from 1954 to the mid-1960's, one must take note of the definition of a desegregated school district used by this agency. A school district was listed as desegregated (1) if the district had a black student actually enrolled in the same school with a white student, or (2) if the district had declared an official policy of desegregation. With a definition such as this, it was possible for a district designated as desegregated to be in actual practice almost, if not entirely, segregated. For example, the first criterion for desegregation designation would have required as a minimum that there be only one black student enrolled with white students in one school in the school district. According to the second criterion, declaration of an official policy of desegregation did not necessarily mean that the district had achieved desegregation in practice. It is therefore important to understand what was meant by the term "desegregated" before one can analyze the patterns of desegregation activity.

Even using the rather unsatisfactory definition of a desegregated district cited above, many southern states were laggard in initiating desegregated schooling (see Figure 3). Four of the six border states had at least one desegregated school district in 1954, while the remaining two began desegregation in 1955. Desegregation came much later to the southern states, especially to those in the "deep" South. Although Virginia, North Carolina, Tennessee, and Florida all desegregated before 1960, it was not until later that the "deep" South states of South Carolina, Georgia, Alabama, Mississippi, and Louisiana desegregated. On a state level the last bastions of segregated schools were Alabama and Mississippi, which desegregated in 1963 and 1964, respectively. In both of these states the initial year of desegregation involved only four school districts, less than four percent of the total number of school districts in each state. By the 1966-67 school year there were still forty-four and thirty-seven percent of the districts in each of these two states not in compliance with HEW guidelines, compared to less than five percent throughout the entire

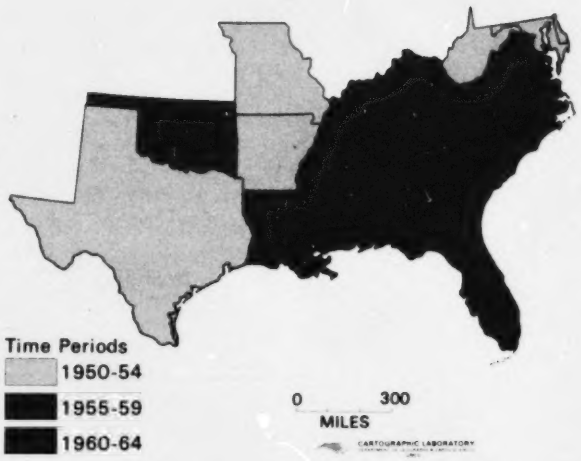

Figure 3. Time Period of First School Desegregation in Southern and Border States (Source: Southern Education Reporting Service, 1967).

region. These two states were similar to other deep South states in that the first desegregation was not voluntary, but rather came as the result of federal court orders.

Table 1 presents data on the percentage of blacks enrolled in schools with whites. Once again there is an obvious contrast between the southern and border states in the rate of desegregation progress with the latter group of states illustrating more desegregation at each time period. School segregation in 1954 was almost total in the southern states, with no blacks attending schools with whites except in Arkansas and Texas. At

TABLE 1. SCHOOL DESEGREGATION STATUS IN SOUTHERN AND BORDER STATES: 1954, 1964, 1966.

State	Percent of Blacks Attending Schools with Whites		
	1954	1964	1966
Alabama	0.000	0.034	4.4
Arkansas	0.020	0.811	15.1
Florida	0.000	2.670	22.3
Georgia	0.000	0.400	8.8
Louisiana	0.000	1.140	3.4
Mississippi	0.000	0.020	2.5
North Carolina	0.000	1.420	15.4
South Carolina	0.000	0.102	5.6
Tennessee	0.000	5.350	28.6
Texas	0.001	7.840	44.9
Virginia	0.000	5.150	25.3
South	0.001	2.250	15.9
Delaware	1.910	62.200	100.0
District of Columbia	NA	86.000	86.3
Kentucky	0.000	68.100	90.1
Maryland	5.120	50.900	65.3
Missouri	NA	42.300	77.7
Oklahoma	0.000	31.100	50.8
West Virginia	4.290	63.400	93.4
Border	NA	58.300	75.7

Source: Southern Education Reporting Service, 1967.

this time only three school districts out of 4,355 in the southern states were classified as desegregated. The percentage of blacks attending schools with whites was quite small in the border states as well, although the values exceeded four and five percent for West Virginia and Maryland, respectively. The ten year span of time between the *Brown I* decision and 1964 saw very little change for the southern states. In only Tennessee, Texas, and Virginia did the values exceed five percent with the value for the entire southern states area being only slightly more than two percent. In contrast, values for the border states ranged from a low of thirty-one percent for Oklahoma to sixty-three percent for West Virginia (excluding a value of eighty-six percent for the District of Columbia). As a result of the 1964 Civil Rights Act, a greater amount of change occurred in the southern states between 1964 and 1966 than during the first ten years after *Brown I*. By 1966 almost sixteen percent of the black students were attending schools with whites. Considerable progress also occurred in the border states such that by 1966 three-fourths of the black students were attending schools with whites.

Despite this progress in school desegregation, the mid-1960's arrived with still much segregation throughout the southern and border areas as well as in other regions of the United States. The situation was not to remain this way for very long, however, especially in the seventeen states that had *de jure* segregation in 1954. Federal court judges began to take more notice of the status of desegregation activity in their regions of jurisdiction; and as a result of this and increased court actions brought by plaintiffs, the pace of desegregation quickened. The rapid desegregation progress that occurred in the South between 1968 and 1972 emanated largely from the Supreme Court decisions in *Green* and *Alexander* which terminated the era of "all deliberate speed."

Although southern school districts started at a higher level of segregation than northern areas in 1954 and approached the mid-1960's with schools still more segregated, the direction of segregation change was different for the two regions. Whereas southern districts experienced a small decline in segregation during the period, northern districts in comparison increased in segregation. Consider the Cleveland, Ohio schools where fifty-seven percent of the black students attended ninety to one hundred percent black schools in 1952 (U.S. Commission on Civil Rights, 1967). But by 1962 the figure had increased to eighty-two percent. This trend toward increasing segregation in northern districts may have been more a function of changing housing patterns and population shifts than any intentional acts by authorities to increase segregation. However, the U.S. Commission on Civil Rights has documented several instances where school officials located new schools in order to maintain or increase segregation.

The Era of Rapid Change, 1968-1972

The index of dissimilarity is a technique that has been used to measure the degree of school desegregation (and residential segregation also). The index can vary between values of 0 and 100. If all schools in a district were either all white or all black, the index would be 100. A racial proportion in each school identical to the proportion in the entire district would yield a value of 0, i.e., if the district enrollment was twenty-five percent black and all schools were also twenty-five percent black.

Using the index of dissimilarity, Farley and Taeuber (1974) have measured the degree of segregation in the elementary schools of sixty of the largest United States school districts for 1967. Their study provides good base data for showing the extent of segregation in large urban school districts in the North and South at a time just prior to the beginning of massive desegregation activity in southern schools. Of the sixty districts studied, thirty-seven were in the North and twenty-three in the South—the South consisting of the southern and border states included in Table 1. The index varied from a low of thirty-nine for Sacramento to ninety-seven for Tulsa and Oklahoma City, with the mean for the sixty districts being seventy-nine. This latter figure certainly emphasizes the relatively high degree of segregation in large urban school districts in 1967. School segregation was greater in southern than in northern districts, with mean index values of eighty-seven and seventy-four, respectively. Almost one-half of the southern districts had values exceeding ninety, compared to only four of the thirty-seven northern districts.

From 1968 to 1972 massive school desegregation took place in the United States, especially in the South. Periodic surveys by HEW's Office for Civil Rights provide data that can be used to analyze trends in desegregation during this period (U.S. Office for Civil Rights, 1970, 1972, 1974). In particular, data from these surveys (subsequently published in various issues of the *U.S. Statistical Abstract*) enable one to examine racial isolation in the schools at the state level for 1968, 1970, and 1972 (U.S. Bureau of the Census, 1970, 1972, 1974). The measurement of segregation or racial isolation used here is the percentage of all black students in the state who were enrolled in ninety-five to one hundred percent minority group schools.

Figure 4 presents the pattern of racial isolation for 1968. Thirteen of the fourteen states with more than fifty percent of the black students enrolled in ninety-five to one hundred percent minority group schools were states where *de jure* segregation had existed prior to 1954. The only *de jure* segregation states not included in this category were Oklahoma, Kentucky, Delaware, and West Virginia. Given its border state location and former *de jure* segregation status, Kentucky had a surprisingly low level of segregation in 1968. Only 26.6 percent of its black students attended ninety-five to one hundred percent minority group schools. Illinois was the only northern state to fall into the most segregated group, ranking as the seventh most segregated state with 72.4 percent of its black students attending ninety-five to one hundred percent minority group schools. The least amount of segregation existed in the northernmost New England states and states located in the northwest quadrant of the nation. In only one of the states included in the least segregated group did blacks account for more than five percent of the total enrollment.

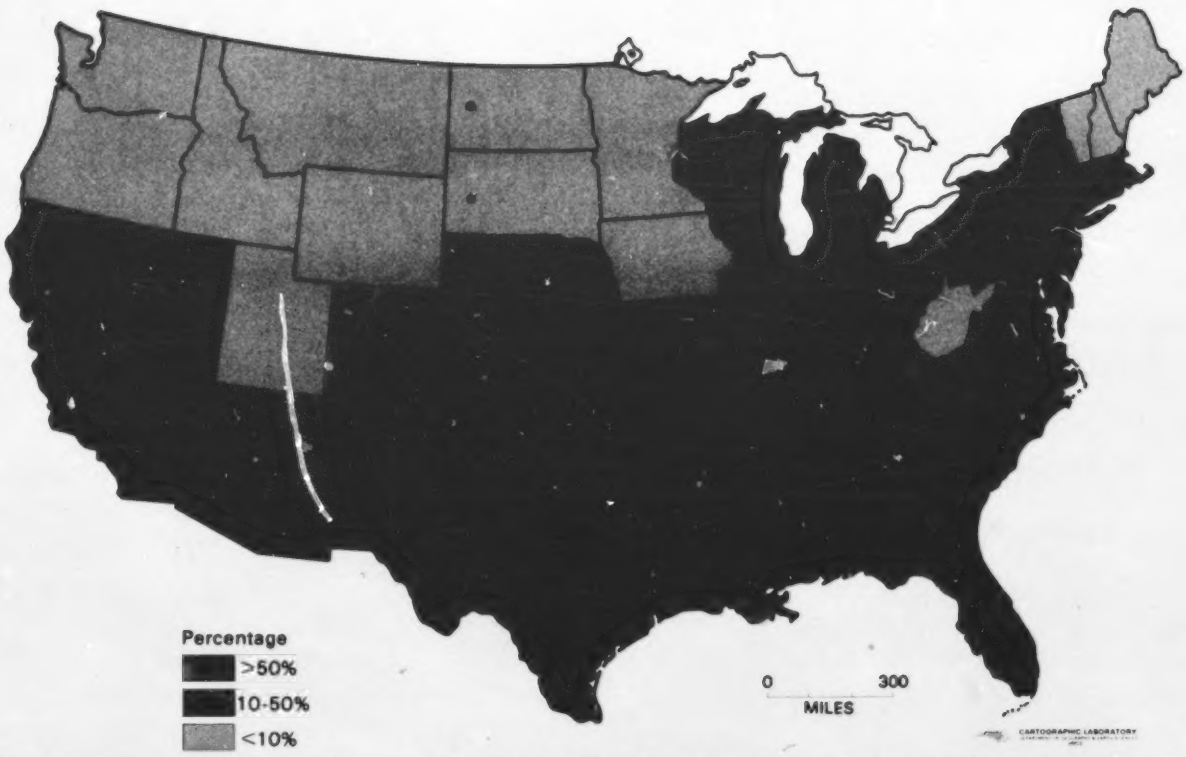

Figure 4. Percentage of Black Students Enrolled in Schools Which Had Ninety-Five to One Hundred Percent Minority Group Enrollment, 1968 (Source: *U. S. Statistical Abstract*, 1970).

Between 1968 and 1972 a major shift occurred in the location of the most segregated states (see Figure 5). Whereas southeastern states were the most segregated in 1968, by 1972 the most segregated states consisted primarily of several large, urban, industrial states of the Midwest and Northeast. This shift reflects the massive desegregation in the South after 1968 precipitated by court orders and the lack of a reduction in segregation in northern areas. Segregation actually increased from 1968 to 1972 in a number of midwestern and eastern states, including Ohio, Michigan, Pennsylvania, and New York.

Coleman's (1975a, 1975b) recent work on school desegregation and white flight includes a study of segregation trends by region between 1968 and 1972. Despite a difference in his method of measuring segregation, his conclusions regarding desegregation trends between 1968 and 1972 are similar to those presented above. He noted that the Southeast changed from the most segregated region in 1968 to the least segregated in 1972. Coleman also examined the relationship between desegregation change and school district size, reporting that in both 1968 and 1972 large school districts were the most segregated. Also, change in desegregation took place to a much greater extent in small districts compared to large ones (Table 2). This pattern was not simply the result of there being more small districts in the Southeast containing large numbers of blacks, because even in the Southeast the reduction in segregation was greater in small districts.

Correlates of the Spatial Pattern of Resistance to Desegregation

On the preceding pages data have been presented on the slow pace of school desegregation in the South following the 1954 *Brown* decision. What obstacles or barriers impeded the pace of desegregation? This slow progress no doubt resulted from a number of factors, including the following: (1) political and school officials had little intent of conforming with the directives of the *Brown* decision unless forced to do so; (2) the *Brown* decision lacked specific guidelines for desegregation and deadlines for the start of desegregation activity; (3) local federal court judges were reluctant to insure desegregation activity because of their own disagreement with the *Brown* decision or because they feared ostracism by whites in their local jurisdictions (Rodgers, 1974-1975); and (4) both the legislative and executive branches of the federal government openly refused to support the *Brown* decision and to monitor compliance with it.

A number of studies conducted on the resistance to desegregation activity, particularly resistance in southern areas, have used a spatial approach. Their analyses used data for such areal units as states, counties, and cities, and our interest will focus upon the significant

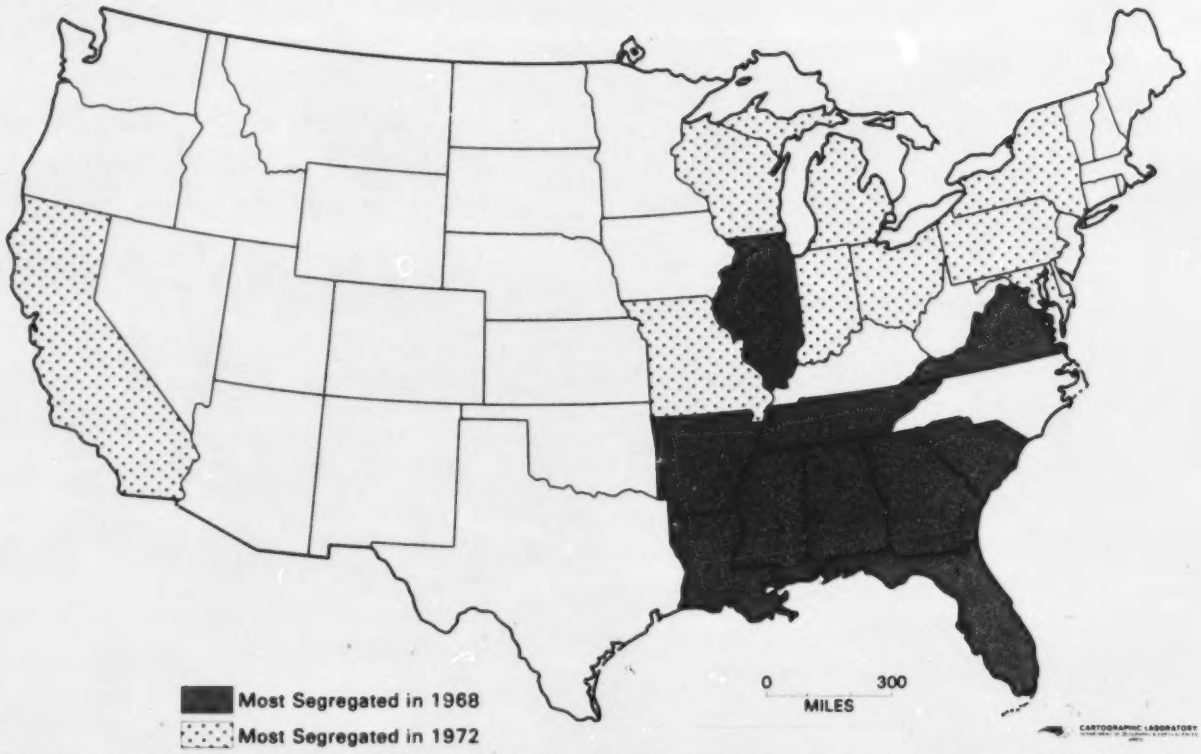

Figure 5. Ten Most Segregated States in 1968 and 1972 as Measured by the Percentage of Black Students Enrolled in Ninety-Five to One Hundred Percent Minority Group Schools (Source: *U.S. Statistical Abstract*, 1970, 1974).

spatial co-variants of desegregation resistance and progress.

Resistance Via Voting Patterns

Shortly after the *Brown* decision, an indication of one of the important future co-variants or variables associated with the spatial pattern of resistance was provided by voting actions on segregationist resolutions or amendments in Mississippi and Virginia. In Mississippi a vote was held in 1955 on a public school abolition amendment to the state constitution. A vote for the amendment was a segregationist vote in that public officials were preparing to abolish public schools if necessary in order to maintain segregation. Public monies would have been used to support white private schools. The amendment passed with a 69.7 pro-amendment vote. We can identify close relationships in the variation in the strength of this segregationist vote across Mississippi's eighty-two counties to the proportion of blacks in the total population. The strongest segregationist vote occurred in those counties containing the largest proportions of blacks (see Figures 6 and 7). The strongest support for the amendment came from the rich agricultural counties located in the delta region of the state, whereas the predominantly white populated hill counties of northeast Mississippi provided the major opposition. The voting patterns reflect the differences in the economy and population of these two areas of the state. Counties containing the larger urban areas of the state also did not support the amendment as strongly as did the delta region, thus indicating somewhat less resistance to social change in the cities. Why didn't black voters in those counties containing large numbers of blacks swing the vote in the other direction? Blacks in Mississippi and in many other areas of the South during this period could not vote because of impediments to their voting eligibility.

In 1956 residents of Virginia voted on a proposal to

TABLE 2. SCHOOL SEGREGATION TRENDS FROM 1968 TO 1972 FOR THE U.S. AND SOUTHEAST BY SCHOOL DISTRICT SIZE*

District Size in Number of Students	U.S.			Southeast		
	1968	1972	Change	1968	1972	Change
>100,000	.71	.65	−.06	.84	.44	−.40
25,000–100,000	.66	.39	−.27	.77	.28	−.49
10,000–25,000	.54	.22	−.32	.70	.16	−.54
5,000–10,000	.59	.14	−.45	.74	.13	−.61
2,500–5,000	.56	.09	−.47	.74	.09	−.65
<2,500	.44	.03	−.41	.70	.04	−.66

* The segregation index is the proportion of the black child's schoolmates who are white, divided by the proportion of students in the system who are white, with the resulting number subtracted from 1.0.

Source: Coleman, 1975b: 3.

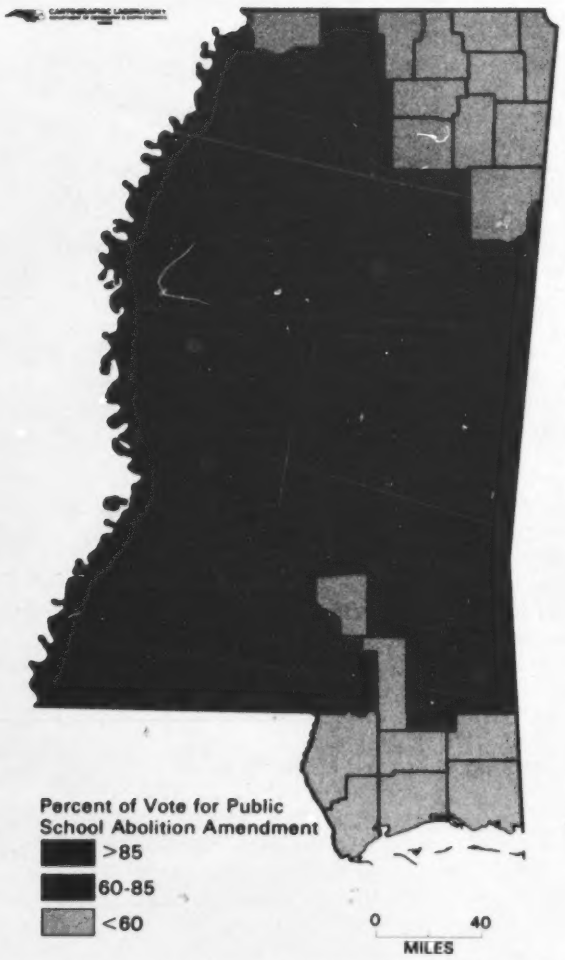

Figure 6. Percent of Votes for 1955 Public School Abolition Amendment in Mississippi by County (Source: *Southern School News*, January 1955).

call a convention for voting on a constitutional amendment which would have enabled the state to provide financial aid to white families wishing to send their children to private schools to avoid mixing with blacks. A vote for the proposed convention could be interpreted as a vote for segregated schools. The vote passed statewide with 67.5 percent favoring calling a convention. Once again the geographic pattern of support for the convention was closely related to the proportion of blacks in the total population in the counties and cities of the state (Ogburn and Grigg, 1956; Gates, 1962). The correlation at the county scale between the percent vote for the convention and the percentage of the black population was +.67. In the twenty-seven cities included in the study the correlation was +.66. The only areas voting against the proposal were western mountain counties and cities and several counties and cities in the metropolitan Washington, D.C. area.

There also was an inverse relationship between the educational level of the nonwhite population and the percentage vote for the proposed convention, i.e., whites voted most strongly for the convention in areas where the educational level of nonwhites was the lowest. Although there was some correlation between the percentage of the nonwhite population and the educational level of the nonwhite population, both variables exhibited variance with the convention vote not held in common with the other, i.e., the partial correlations of each of the two variables with the segregation vote were quite large also. The substantial difference between the educational levels of whites and nonwhites produced a larger vote favoring the proposed convention. A difference also existed in the level of support for the convention between cities and rural areas, with less support in cities.

The studies cited above, as well as several others that have attempted to determine the correlates of desegregation resistance, have involved a study of voting actions and not actual school desegregation activity (see Pettigrew and Campbell, 1960; Grunbaum, 1964; Vander Zanden, 1961; Lustig, 1962). The phenomenon of school desegregation itself requires examination to determine

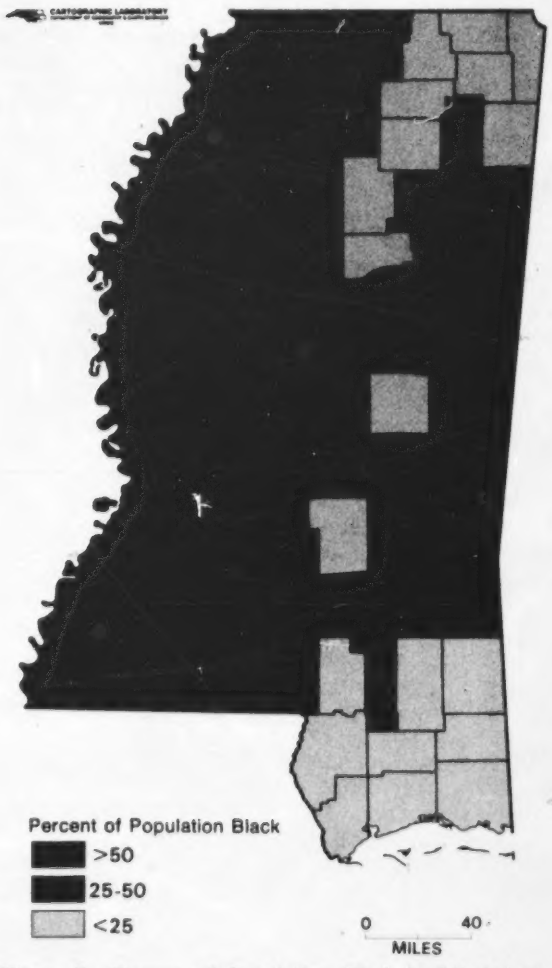

Figure 7. Percent of Population Black in Mississippi by County, 1950 (Source: *U.S. Census of Population*, 1950).

the co-variants of its spatial pattern of acceptance or rejection.

Correlates of School Segregation-Desegregation

The preceding discussion suggested that a strong link exists between the intensity of segregationist sentiment and the proportion of blacks in the population. Percent black has long been recognized as a key variate of southern politics (Key, 1949). Have actual school segregation-desegregation patterns themselves been associated with proportion black as well? The answer is affirmative regardless of the geographic scale of analysis (i.e., state, county, or city), the time period of the analysis, or the manner in which one measures the level of segregation or desegregation.

Using the seventeen southern and border states as the observational units, Vanfossen (1968) demonstrated a strong correlation (an r value of −.78) between the percentage of nonwhite population and the percentage of black students enrolled in schools with whites during the 1965-1966 school year. An examination of the dates of the first school desegregation at the county level for the border states of Texas, Oklahoma, Missouri, Kentucky, and West Virginia revealed that the percentage of blacks in the county population was an important factor associated with the date of first desegregation activity, with desegregation occurring earliest in those counties with small percentages of blacks (Pettigrew and Cramer, 1959). The correlation increased after controlling for a number of other important variables.

Matthews and Protho (1964) conducted a study of school desegregation in 997 southern counties located in the eleven states of the former Confederacy. They correlated a set of twenty-one social and economic attributes of these counties with a dichotomized dependent variable which measured whether or not the county contained a desegregated school in 1960. A number of variables were found to be important in explaining this variation in desegregation, including the percent of population black in 1950, the percent of population urban, and the educational level of nonwhites. This study also included a set of eight political variables, but the social and economic attributes were found to provide a greater explanation of the variation in desegregation. One unexpected finding was the low correlation between black voter registration and school desegregation. Later Robey (1970) conducted a similar study using 872 counties in these same eleven states. He measured school desegregation as the percentage of black students enrolled in schools with whites for the year 1968. Only eight of forty-six independent variables included in the Robey study had correlations with the dependent variable greater than .30. Partial correlations were computed between each of these eight variables and the dependent variable in order to identify any spurious relationships. Only two variables maintained a strong relationship to the dependent variable after the partials were computed: percent population black in 1960 and percent George Wallace for President vote in 1968. Interestingly enough, these two variables were not significantly intercorrelated. Thus they can be interpreted as measuring different phenomena.

A comparative analysis of urban areas by Dye (1968), in an attempt to discover the social, economic, and political conditions associated with variations in the extent of school segregation, included both southern and northern cities and as such represents one of the few studies to investigate the co-variants of school segregation or desegregation in northern localities. He measured segregation as the percent of the total black elementary students enrolled in schools ninety to one hundred percent black. For both subsamples of twenty-one southern and thirty-four northern cities, the percentage of students black was the variable most strongly related to the level of segregation. The computation of partial correlations further revealed that this relationship was not dependent upon the intervening effects of other variables.

The above studies certainly present abundant evidence for a strong relationship between the percent black of an area and the level of school segregation. What is the explanation for this relationship, however? Why was segregation maintained at its highest level in areas where blacks were a relatively large percentage of the population? A number of possible explanations can be advanced. One explanation relates to the importance of the proportion black to the potential level of racial mixing that would result in the schools if desegregation occurred. Desegregation of school districts where the black proportion was large would have required the mixing of whites with large numbers of blacks. In fact, in districts where the proportion black approached or exceeded fifty percent, there was the possibility of white children becoming the minority in predominantly black schools. Opinion survey studies provide evidence that white resistance to desegregation increases as the possibility of a higher percentage black school increases (for example, see Knapp and Alston, 1972–1973). These studies report that the percentage of white parents in both the North and South who object to sending their children to schools with blacks increases with increasing percentages of blacks in the school. Regional differences still exist in attitudes toward the acceptance of school desegregation, although the gap has narrowed with the passage of time (Greeley and Sheatsley, 1971).

Another explanation of the association between a high black proportion in the population and strong resistance to desegregation is that such areas are also those with the strongest tradition of white supremacy which resulted in practices and institutions to insure the subordinate position of blacks (Vanfossen, 1968). Specifically, maintaining the already low socioeconomic status of blacks in such areas would fortify the whites' resistance to mixing with them.

The various factors that have been found to be associated with segregation patterns can be classified into three groups: (1) socioeconomic; (2) demographic; and (3) political (Figure 8). Socioeconomic variables include measures of the education and income levels of blacks, the magnitude of inequality of white and black education and income, black employment in manufacturing

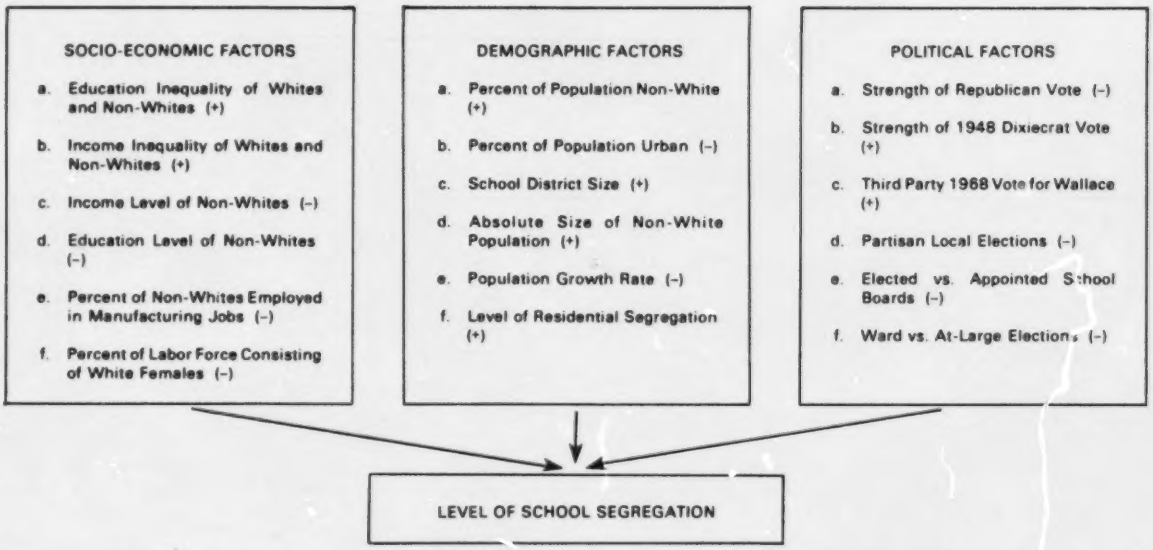
SOCIO-ECONOMIC FACTORS
a. Education Inequality of Whites and Non-Whites (+)
b. Income Inequality of Whites and Non-Whites (+)
c. Income Level of Non-Whites (–)
d. Education Level of Non-Whites (–)
e. Percent of Non-Whites Employed in Manufacturing Jobs (–)
f. Percent of Labor Force Consisting of White Females (–)
DEMOGRAPHIC FACTORS
a. Percent of Population Non-White (+)
b. Percent of Population Urban (–)
c. School District Size (+)
d. Absolute Size of Non-White Population (+)
e. Population Growth Rate (–)
f. Level of Residential Segregation (+)
POLITICAL FACTORS
a. Strength of Republican Vote (–)
b. Strength of 1948 Dixiecrat Vote (+)
c. Third Party 1968 Vote for Wallace (+)
d. Partisan Local Elections (–)
e. Elected vs. Appointed School Boards (–)
f. Ward vs. At-Large Elections (–)
LEVEL OF SCHOOL SEGREGATION

Figure 8. Spatial Correlates of the Level of School Segregation (signs indicate directions of the relationships).

jobs, and white females as a proportion of the total labor force. The education and income levels of blacks have been found to be inversely related to the level of school segregation, whereas measures of education and income inequality have demonstrated positive correlations with segregation levels. Vanfossen's study (1968) of desegregation across the southern and border states in 1965 revealed that the least segregation existed in those areas where nonwhite income and education levels were the highest and where there was the smallest difference between white and nonwhite income and education. Matthews and Protho (1964), Dye (1968), Robey (1970), and Moore (1973) reached similar findings in their studies which were conducted at different geographic scales, including county units and cities.

Of what significance is the socioeconomic well-being of blacks to southern race relations and to school segregation-desegregation in particular? Higher education and economic levels for blacks have provided them with more political and economic power to push for desegregation. Education and income levels of blacks can indicate the leadership potential of the black community to effectuate some degree of school desegregation. This should have been especially important to desegregation progress during the 1950's and 1960's since the burden of desegregation fell upon the blacks. Not only did blacks initiate desegregation court suits but also they, and not whites, exercised freedom-of-choice in school selections that resulted in the meager desegregation which occurred in the South during this period. Equity in the education and income levels of whites and blacks also made blacks more acceptable to whites in such areas as participation in community affairs and school desegregation.

Several studies have suggested an association between various employment variables and segregation levels. It has been assumed that the more traditional areas of the South opposed school desegregation with the greatest resistance. Pettigrew and Cramer (1959) used the percentage of white females in the total labor force in an attempt to measure traditionalism, i.e., an area with a very small percentage of its labor force consisting of white females reflects the historical tradition in the South against women entering the labor force. Counties which desegregated schools first in the border states tended to have a higher percentage of white females in their labor force. Black employment in manufacturing also has been interpreted as representing a departure from the traditional conditions in the South, i.e., the higher the percentage of blacks employed in manufacturing jobs, the more separated blacks were from their traditional economic roles in domestic and agricultural jobs (Moore, 1973).

Demographic factors, in addition to percent black in the population, associated with geographic variations in segregation levels include the percent of the population urban, population size of the city or school district, the absolute size of the black population, and the degree of residential segregation in the area. Studies of desegregation patterns in the ten years after *Brown* indicated that desegregation came first to the more urban counties in the South (Pettigrew and Cramer, 1959). Of course the degree of urbanism itself was correlated with other factors such as high education and income levels which may have been the true predictors of desegregation patterns. In a study of the spatial diffusion of the decision to desegregate in the counties of eleven southern states for the period 1954 to 1964, Florin (1971) interpreted the process of desegregation as diffusing down through the population hierarchy similar in manner to modernization innovations. Larger districts tended to accomplish some degree of integration at an earlier date than smaller districts.

One must interpret the relationship between urbanism

and desegregation with a great deal of caution. Although it is true that desegregation came more quickly to urban than rural areas in the early years after *Brown*, by the late 1960's desegregation began to take on a quite different pattern. The urban hierarchical diffusion pattern that appeared to be emerging in the late 1950's and early 1960's never materialized, as evidenced by desegregation data for the late 1960's and early 1970's (see Dye, 1968; Moore, 1973; Giles, 1975). In fact, the opposite has occurred. For example, Moore (1973) found that the one variable most highly correlated with the level of school segregation among 180 southern city school districts was the number of black students in the district, i.e., the larger districts had higher levels of segregation. The desegregation task was much greater in larger school districts. When faced with the task of achieving *real* desegregation (i.e., large-scale racial mixing), the pattern of diffusion reversed itself in terms of the urban hierarchy.

Logistically it was much easier to desegregate small districts than large ones. Many small districts could have been desegregated by perhaps closing only one black school or by a simple redrawing of attendance zones. Such a simple solution was not available to large districts. Desegregation would have required the reassignment of large numbers of white students to formerly black schools located in ghetto areas. Whites resisted this when massive desegregation finally came to many large urban school districts between 1968 and 1972 because of the scale of disturbance among the previous white attendance patterns in the larger districts.

Although the socioeconomic and demographic factors have been stronger correlates of segregation-desegregation patterns than political factors, nevertheless a number of relevant political variables also have been identified that provide significant explanations of the spatial variance. The level of segregation has been found to be inversely related to the strength of the Republican vote in the South (Matthews and Protho, 1964; Robey, 1970). No doubt some of this relationship may be spurious in that the strength of the Republican vote is also correlated with other variables which are better predictors of variance in segregation. As noted earlier, Robey (1970) did find a significant inverse relationship between the level of desegregation and the percent of the vote in 1968 received by the third party presidential candidate, George Wallace. The strength of this relationship decreased little after controlling for a number of other political as well as socioeconomic and demographic variables.

Dye (1968) found a relationship between the "political" level of the school district and segregation, especially for his sample of southern cities. In the more "political" areas, i.e., cities that had partisan instead of nonpartisan elections, elected versus appointed school boards, and ward versus at-large elections, he found less school segregation. Under such circumstances blacks had more power to effectuate changes.

It is likely that some of the important factors in explaining variance in the level of school segregation-desegregation in the 1950's and 1960's (Figure 8) may not be as important in the 1970's if one seeks to develop a new explanatory model. The presence or absence of a federal court order assumed great importance after 1968 in understanding variations in desegregation among school districts, i.e., a legal factor intervened to influence the pattern. This change is reflected in the fact that in southern school districts the factor of percent black in the district declined dramatically in its correlation with the level of segregation between 1968 and 1970 (see Figure 9.)

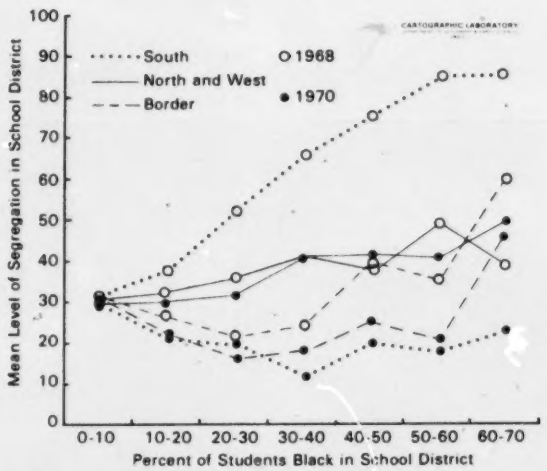

Figure 9. Regional Changes in School District Segregation in Relation to Percent Black, 1968-1970 (Source: Adapted from Giles, 1975).

III. FOUR CASES OF URBAN SCHOOL DESEGREGATION

Having considered the chronology of school desegregation legal events, regional patterns of segregation-desegregation, and correlates of these patterns, we can now examine more closely some recent desegregation efforts in several large urban school districts that have been battlegrounds for the busing controversy of the 1970's. Brief descriptions of widely publicized desegregation experiences of four urban districts—Charlotte,

North Carolina; Richmond, Virginia; Pontiac, Michigan; and Boston, Massachusetts—can illustrate some similarities as well as differences among the desegregation experiences of these four cities.

The Charlotte-Mecklenburg, North Carolina school system was one of the first urban districts in the South to desegregate. The district also became the testing ground for the use of busing as a means of desegregating schools (Swann, 1971). Charlotte-Mecklenburg exemplifies a metropolitan district in that its school district boundaries encompass both the city and the entire county (Mecklenburg) in which Charlotte is located. The Richmond, Virginia school system, in contrast, is a city system only. Richmond already was a majority black school district prior to the beginning of its large-scale desegregation, in contrast to a much lower black ratio in Charlotte. Pontiac, Michigan represents one of the first northern school districts to use busing for desegregation. The school system received a great deal of national publicity at the beginning of its desegregation experience in 1971. Lastly, Boston, Massachusetts was selected for discussion because of its relatively recent experience with desegregation and busing and the strong resistance that followed.

Charlotte-Mecklenburg

Desegregation began in the Charlotte-Mecklenburg school district in the fall of 1970 following a federal court order. At this time, total enrollment in the system exceeded 80,000 students with an approximate seventy-thirty white-black ratio. During the first year of desegregation (1970-1971), the district operated under a plan designed by a court-appointed educational consultant. The district has operated since that time under a plan devised by its own administrative staff. Prior to desegregation approximately one-half of the more than one hundred schools in the district were clearly identifiable as one-race schools. Under the desegregation plan no school was allowed to have more than a fifty percent black ratio, thus requiring a massive amount of desegregation. Although the plan did not require racial balancing, i.e., an approximate seventy-thirty ratio in each school, the racial composition of schools generally varied between twenty and forty-five percent black. Because of highly segregated housing patterns, a common denominator of urban areas, it was necessary to use such techniques as redrawing attendance zones, school pairings, and bus transportation in order to desegregate schools.

One important feature of the Charlotte desegregation plan was that the burden of busing did not fall equally on all areas of the school district (Figure 10). Black students incurred the major burden of busing. The desegregation plan not only tended to minimize the total amount of bus transportation necessary to achieve desegregation but also minimized white opposition to busing because of their small involvement (Lord, 1975). In some black neighborhoods students did not attend the nearest school for their grade level for as many as six or more of the twelve years of public schooling. Only a limited number of white neighborhoods required much

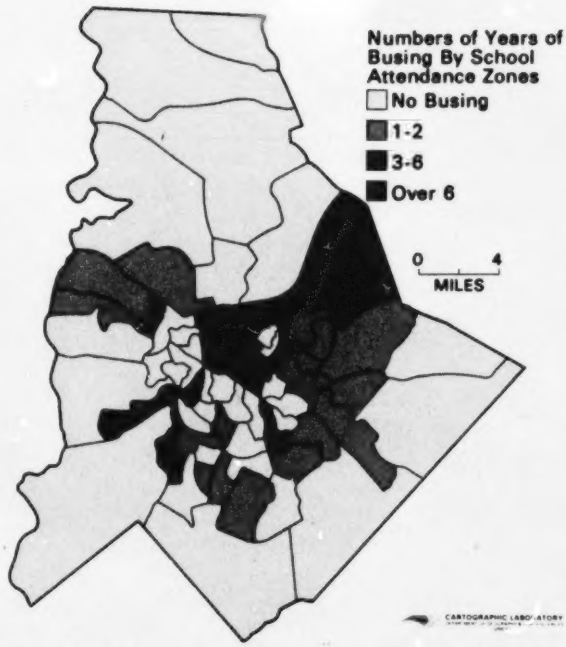

Figure 10. Spatial Patterns of the Busing Burden in the Charlotte-Mecklenburg School District, 1971-1973 (Source: Charlotte-Mecklenburg School System).

busing, but where this did occur strong opposition surfaced. A new plan, implemented in 1974, removed some of these inequities in the pupil assignment plan.

Desegregation in Charlotte, as in many urban districts, instigated the formation of groups of parents opposed to busing. The principal organization in Charlotte was the Concerned Parents Association or CPA (Lord and Catau, 1976). This organization was successful in electing three antibusing candidates to the school board in 1970, and although the organization claimed support from all areas of the community, it was clear that the core of its support came from the white middle- and lower-middle-class, especially from parents of children who were scheduled to be bused out of their neighborhoods to distant and formerly black schools.

Richmond

Richmond implemented an interim desegregation plan during the 1970-1971 school year while school officials awaited the Supreme Court's decision in the *Swann* case. Following the April 1971 *Swann* decision, the school district initiated a more extensive desegregation plan for the 1971-1972 school year.

One of the most significant events in the history of the Richmond city school system has been its racial transformation from majority white to majority black (Figure 11). Except for a downward trend during the 1930's, the system increased in total enrollment between 1919 to 1966. Since then there has been a large loss of students with the exception of a short-term gain associated with city annexation in 1970. Black enrollment increased

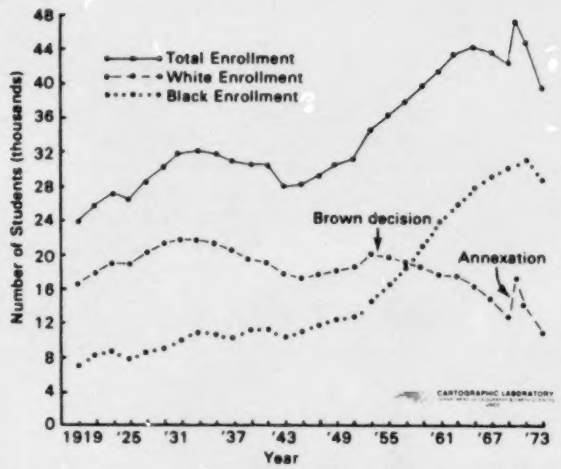
Total Enrollment
White Enrollment
Black Enrollment
Brown decision
Annexation
Number of Students (thousands)
Year
1919 '25 '31 '37 '43 '49 '55 '61 '67 '73
0 4 8 12 16 20 24 28 32 36 40 44 48

Figure 11. Racial Transition of the Richmond, Virginia City School System (Source: Richmond City School System).

throughout the period from 1919 to 1971, but declined by 2,000 students during the next two years. White enrollment by comparison peaked in 1932, declined for more than a decade, then exhibited an upward turn after World War II (postwar baby boom). This last upward trend peaked in 1954 and was followed by a large loss of white students interrupted only temporarily by annexation in 1970 of a predominantly white area. Thus desegregation occurred in a majority black system as black enrollment had surpassed white enrollment in 1958.

The majority black system has produced unique problems for Richmond in its desegregation effort. No doubt the process of white flight was accelerated because of the racial isolation of white students in majority black schools. In some schools whites were less than twenty percent of the total enrollment. Richmond school officials had forecast that the system eventually would be composed only of poor blacks. Fearing the consequences of this racial isolation and the continued loss of white students, Richmond school officials developed a consolidation plan that would have merged the Richmond city schools with the predominantly white systems of surrounding Henrico and Chesterfield Counties. A consolidation plan such as this would have produced a new school system which would have been approximately two-thirds white. The metropolitan plan called for the division of the area into six subdivisions, five of these with wedges extending into the central part of Richmond in order to distribute blacks to each of the divisions (Figure 12). The black ratio was to vary between eighteen and thirty-eight percent for the six areas. The plan would have greatly facilitated desegregation efforts in a number of instances (Pettigrew, 1974). For example, Marshall High School in Richmond city was seventy-three percent black, whereas Henrico High School, located only 1.4 miles distant in Henrico County, was ninety-six percent white. But Henrico and Chesterfield County officials opposed the consolidation plan. Although the federal district court approved the desegregation plan, the appeals court reversed the decision. The Supreme Court later upheld the appeals court decision.

Richmond's school system is now more than seventy-five percent black. Its future viability as a desegregated system remains an unanswered question. The majority black ratio in the system and the limitation of school district boundaries to the city of Richmond continue as major problems in its desegregation effort.

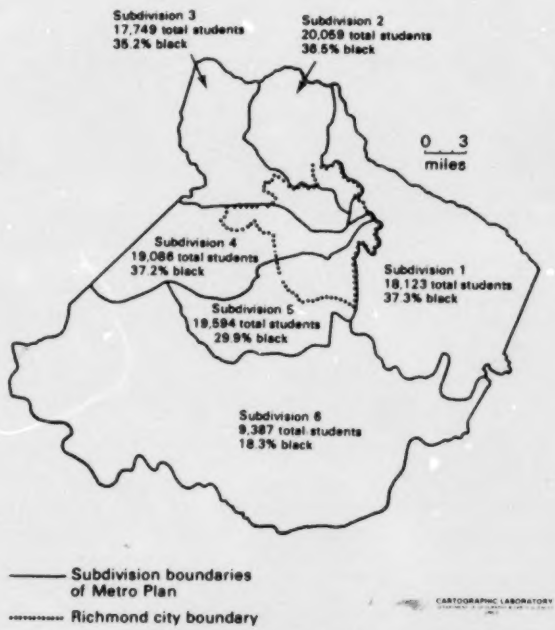

Figure 12. Metropolitan School District Consolidation Plan for Richmond, Virginia, Henrico and Chesterfield Counties, 1971 (Source: Richmond City School System).

Pontiac

Pontiac is an industrial city of 85,000 population located thirty miles north of Detroit. A large segment of its labor force works at three General Motors manufacturing plants. Although the Pontiac school district covers thirty-nine square miles, an area twice the size of the city, ninety percent of the population lives in Pontiac. A majority of the black population lives in only three census tracts in the southern part of the city.

In 1970-1971, the school year preceding desegregation, only 3,500 students of a total enrollment of 23,000 rode buses to school (U.S. Commission on Civil Rights, 1972). More than one-half of the black elementary school students attended six schools with black ratios in excess of ninety percent. Similarly, a majority of black junior high school students attended two of the six junior high schools in the district. In February 1970, a black federal district court judge ruled that Pontiac schools were segregated. The court cited past efforts by school officials to maintain segregated schools by redrawing attendance lines and locating new schools. The judge's order to desegregate the district was appealed. After holding the case for a year while waiting for the Su-

preme Court's decision in *Swann*, the appeals court upheld the district court's decision.

The desegregation plan called for the busing of elementary students at either grades 1-3 or 4-6. Junior high students (grades 7-9) were bused for two of the three years. The two high schools were not involved in any busing since they had been desegregated one year earlier by redrawing attendance boundaries. Kindergarten students were not involved in the desegregation plan. The black ratio in all schools varied between twenty and forty percent. The desegregation plan involved the cross-city transportation of almost 10,000 of Pontiac's students. The Pontiac plan appeared to be more equitable than the Charlotte desegregation plan, i.e., all segments of the community tended to share equally in the busing program.

Pontiac became a national symbol of resistance to busing after the bombing of ten school buses in 1971 (Serrin, 1973). On the opening day of the 1971-1972 school year, five women chained themselves to a gate at the school bus yard in an attempt to prevent buses from leaving. An antibusing organization, the National Action Group or NAG, led by Irene McCabe, was formed during the summer of 1971 to oppose the busing plan. The group attempted a school boycott, but it was unsuccessful as attendance increased steadily after the first day of classes. NAG did succeed in closing down a General Motors plant when the workers refused to cross picket lines. Neither the General Motors management nor the United Auto Workers Union took sides during the busing controversy.

Unfortunately the headlines produced by the school bus burnings have tended to mislead the public greatly as to the real success or failure of the desegregation program in Pontiac. Today interest in Pontiac desegregation is not directed toward this turmoil or violence, but rather is related to the calm which has come to the community. Several years of busing experience, however, have not changed the attitudes of parents toward the use of busing in achieving integrated schools. Although parents remain favorably disposed toward integrated schooling, they still remain opposed to busing (Slawski, 1976).

Boston

The federal district court ruled in June 1974 that the Boston School Committee, the policy body of the school system, had unconstitutionally fostered and maintained a segregated public school system by selecting new school locations, using portable classrooms, and drawing attendance lines. The Committee disagreed with the court's interpretation by taking the position that segregation resulted from housing patterns and that they had operated a valid neighborhood school system (U.S. Commission on Civil Rights, 1975). The court did not concur.

Boston had adopted an open enrollment policy in 1961 in order that blacks could transfer to white schools. But in 1965 Boston had forty-five racially imbalanced schools, i.e., schools with enrollments more than fifty

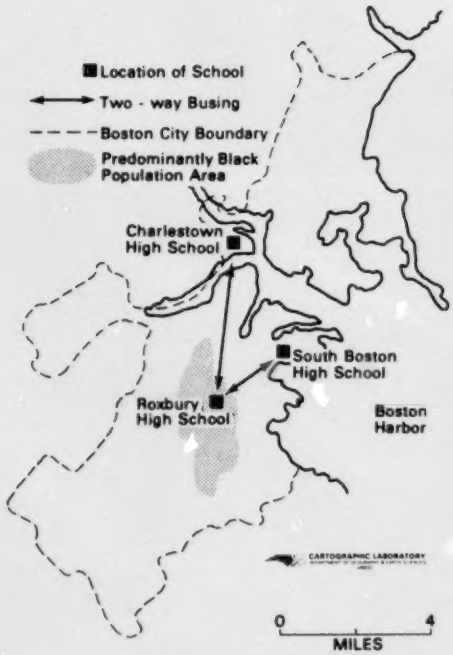

Figure 13. Location of Conflict in Boston School Desegregation, 1975.

percent black. The open enrollment policy inappropriately placed the responsibility for desegregation in the hands of parents rather than appropriate school officials. The Racial Imbalance Act passed by the state of Massachusetts in 1965 also did little to promote desegregation because it did not affect white schools. Impatient with the slow progress of desegregation, black parents organized two programs of their own. Blacks in the Roxbury area organized Operation Exodus in the 1965-1966 school year for the purpose of transporting several hundred students to white schools (Teele, 1973). In addition, the Metropolitan Council for Educational Opportunity (METC), formed in 1966, involved the transportation of more than 2,000 black students to suburban school districts which volunteered to accept them.

The federal district court in 1974 adopted a two-phase remedy for the segregated school system. Phase I, implemented in the 1974-1975 school year, called for reducing racial imbalance in schools by redistricting, reorganizing grade structure, and transporting by bus more than 18,000 students in the 94,000 student system. Phase II, implemented in the 1975-1976 school year, resulted in a more complete desegregation of schools than Phase I, as evidenced by the busing of 26,000 students.

The strong resistance by whites and the turmoil that accompanied desegregation can be attributed in part to the lack of leadership in the city and in the school system. The Boston School Committee fought bitterly against the use of busing as a means of desegregation. Also, the mayor and other city officials provided little support. Defiance of the court's findings by public offi-

cials certainly created an atmosphere of hostility. Prior to the opening of schools in 1974, the consolidation of several antibusing groups under an umbrella organization, Reserve Our Alienated Rights (ROAR), solidified resistance to busing. Many public officials were associated with this organization. The boycott of schools was a successful form of resistance. During the 1974-1975 school year almost one-fourth of the students remained out of the public schools.

The greatest resistance to desegregation came from Irish Catholic working-class neighborhoods such as South Boston and Charlestown (Massey, 1976). Whites who had attended Charlestown High School and South Boston High School were made part of a two-way busing program with black Roxbury High School (Figure 13). These working-class whites perceived blacks as aliens and as a threat to the cohesion of their local neighborhoods. In fact for many of these whites the neighborhood was simply an extension of the family. Working-class whites have been characterized as more "private regarding" and less "public regarding" than whites of higher status, i.e., having less concern for the public interest and the welfare of the total community (Wilson and Banfield, 1964). Perhaps one could have anticipated very strong resistance from whites in the Charlestown and South Boston areas.

IV. SPATIAL ORGANIZATION AND URBAN SCHOOL DESEGREGATION

Housing Patterns and School Locations

Residential Segregation

The pattern of racially segregated housing is one of the major obstacles in urban spatial organization to the desegregation of schools. Because of the high degree of housing segregation in U.S. cities, any plan that assigns students to schools in their neighborhood or to those nearest their homes obviously will result in segregated schools. It would be logical that an effective desegregation plan require the transportation of some students out of their local neighborhoods. Thus the word "busing" has become synonymous with desegregation activity in large urban school districts. Opponents of desegregation and busing frequently have called for the continuation of the neighborhood schools, realizing full well that such a position supports maintaining segregated schools. Although opinion surveys have shown a trend toward greater acceptance by whites of integrated schools, these surveys also have indicated that whites remain strongly opposed to school busing, which is the only means to desegregate schools as long as segregated housing patterns persist.

In northern cities where there has been a strong tradition of neighborhood schools, the level of school segregation is consistent with the level of residential segregation (Farley and Taeuber, 1974). The correlation between residential segregation and school segregation in 1967 for thirty-seven large northern school districts was +.79 (Figure 14). Prior to the desegregation of many urban school districts between 1968 and 1972, school desegregation patterns in the South also reflected, to some degree, residential segregation. However, court intervention in the South during this period weakened this relationship so that school districts with similar levels of residential segregation had very different levels of school segregation, depending upon whether or not the district had been desegregated by court order.

There is no trend toward any significant decline in the level of residential segregation in U.S. cities, despite open housing laws and evidence of the white population's increasing acceptance of residential integration with blacks of similar economic and professional levels. Residential segregation remains very pervasive, as evidenced by an average value for the index of dissimilarity of 85.1 (see Chapter Two) for a sample of 109 cities in 1970 (Farley, 1975a). Although white residential areas are segregated by socioeconomic status, black residential areas do not have equal magnitudes of segregation by income and occupation. Since there is no trend toward any significant reduction in residential segregation, school assignment plans that continue to assign students to neighborhood schools or to those nearest their homes will continue to produce segregated schools.

City to Suburb Migration

Another aspect of urban residential patterns relevant to the prospect and physical task of school desegregation is central city to suburb migration. This migration has resulted in a disproportionate share of whites in metropolitan area suburban populations, in effect producing black central cities and white suburbs. Such a trend is especially crucial where separate city and suburban school districts exist, e.g., in Richmond, Memphis, and Detroit. Although the trend toward black central cities has been attributed to the combined effects of a higher natural rate of population increase among blacks, heavy in-migration to cities by blacks, and white

out-migration, it has been demonstrated for a sample of eleven U.S. cities with large black populations that white out-migration is the most significant factor (Long, 1975). And over time white out-migration has tended to increase in its importance relative to the other two factors.

The suburban movement of whites has been even more dramatic in changing the racial proportions of school populations because the migration process has been very selective, consisting largely of whites in the childbearing ages. This selectivity has accelerated the change in racial proportions among school populations and is one of several reasons why school district student populations consistently have a higher proportion of blacks than the proportion of blacks in the total population of the city or school district. As city school systems increase their black majorities, racial isolation of whites occurs. As indicated earlier, the racial isolation of whites has been cited as a major obstacle in attempts to desegregate Richmond city schools.

The disparity between the black proportion of the total population and the black proportion in the public school population is not only because of the high rate of out-migration of whites of childbearing age. Additional factors that account for the disparity include the higher birth rate for blacks and the greater enrollment of whites in private and parochial schools. The disparity can be observed not only at the city or school district level but also on the individual school attendance area basis. Milwaukee's open enrollment policy has resulted in schools whose black proportions are higher than those of the schools' attendance areas (Wegmann, 1975).

Although in recent years black population growth rates in the suburbs of a number of cities have exceeded those of whites, the absolute numbers involved in the change have been much greater for whites than blacks. The lack of blacks in the suburbs cannot be explained on the basis of income differences with whites (Hermalin and Farley, 1973). Considerably larger numbers of blacks would live in suburban areas if their residential distribution were the same as whites of comparable incomes. One obvious explanation is continued housing discrimination against blacks in suburban areas. The suburban movement of blacks has resulted in little reduction of racial residential segregation in the suburbs, and this movement of blacks into the suburbs typically has consisted of expanding central city black housing areas into the suburbs (see Rose, 1969, 1976, and Muller, 1976 for more detail on black suburbanization).

The implications of neighborhood residential patterns on school racial compositions should be clear. But the relationship should not be viewed as only one-directional. The racial composition of a school may in turn affect the racial composition of the neighborhood located in the school's attendance area. A neighborhood which is twenty-five percent black can be expected to have a school with a higher black proportion. In selecting a residence, white families may choose housing in areas where schools contain lower proportions of blacks. Such behavior in residential selection, and hence school selection, can result in a further segregation of schools and housing.

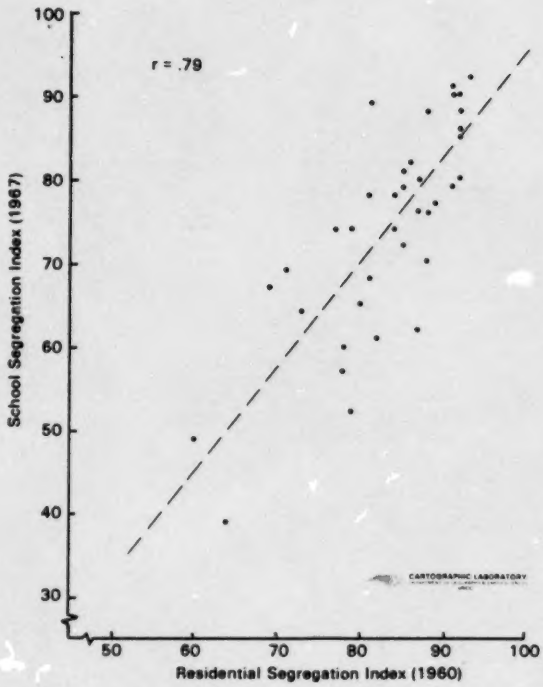

Figure 14. School and Residential Segregation for Thirty-Seven Large Northern School Districts (Source: Adapted from Farley and Taeuber, 1974).

School Locations

The ten high schools in the Charlotte-Mecklenburg school district can be used to illustrate the combined impact of residential segregation patterns as well as the location of schools and population density variations on the desegregation task. Conditions found in the Charlotte-Mecklenburg district are replicated in many other urban districts. Figure 15 indicates proximal regions for each of the district's high schools. A proximal region of a school is the area of the school district closer to that school than to any other. These regions were drawn around each high school by constructing Theissen polygons (see Massam, 1972). If students residing in each of the proximal regions are assigned to the school in that polygon, each student is therefore assigned to the nearest school. The end result is a series of neighborhood school attendance zones in the sense that each student is assigned to the closest school.

But what would be the racial proportions and enrollment levels in each of these schools given the housing pattern and school locations? The racial makeup and enrollment of each school were calculated using data for 1969, the year prior to the beginning of court-ordered desegregation. At that time the high school student population was twenty-four percent black. Large racial imbalances would result for Schools 2 and 4, which would have black ratios of seventy-three and thirty-six percent, respectively, because of the concentration of the black population in the northern and western areas of Charlotte. In contrast, the other schools would have white to

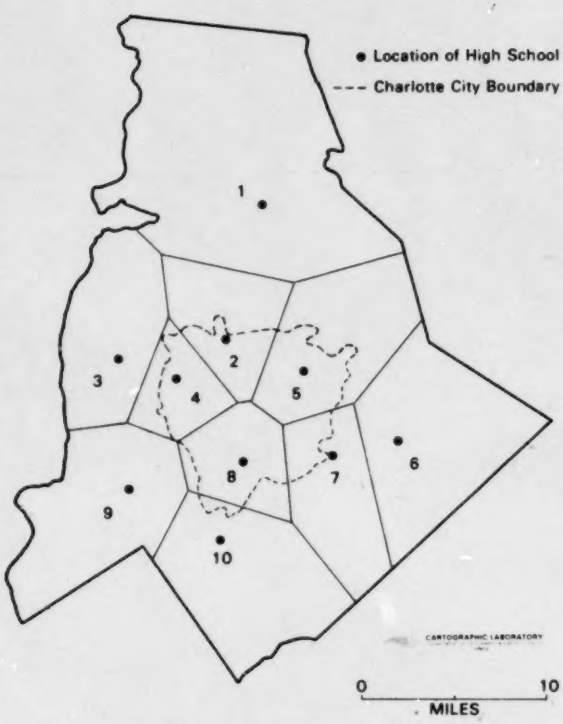

Figure 15. Proximal Regions for High Schools in the Charlotte-Mecklenburg, North Carolina School District.

black racial imbalances, e.g., Schools 3, 5, 6, 7, and 10 would have less than a ten percent black ratio, and Schools 6 and 7 would be more than ninety-seven percent white. Problems of overcrowding and undercrowding also would exist for several schools irrespective of the racial makeup. The assignment of each high school student to the nearest school would result in an enrollment of 3,163 in School 2, 2,934 in School 5, and 2,993 in School 8, all of these schools being overcrowded. In comparison, Schools 1, 3, 6, and 9 would have less than 970 students each, with School 9 being assigned only 480 students. Even if no racial balancing was attempted for any of the schools, it would not be reasonable to expect that all students could attend their nearest schools as overcrowding of some schools and the underutilization of others would occur. Lower enrollment levels in the suburban schools in the county perhaps could be justified partially on the basis of future population growth in these areas. The overcrowding at School 2 reflects the high density of black population residing in low-income housing in that area of the city and county. The locations of large and predominantly black public housing projects also have contributed to residential segregation and the resulting problem of racial imbalances and overcrowding.

An examination of the actual racial makeup of these high schools in 1969 reveals several obvious disparities with the racial makeup of the school populations within the proximal regions. Although seventy-three percent of the students residing in the proximal region for School 2 were black, the enrollment of this school was one hundred percent black in 1968. Similarily, although the proximal region of School 4 had a school population which was thirty-six percent black, the actual school enrollment was ninety-three percent white. These figures suggest that students were not being assigned to the nearest schools and that perhaps attendance zones were being gerrymandered to lessen the mixing of whites and blacks.

Techniques of Urban School Desegregation

In view of features of urban spatial organization such as segregated housing patterns, suburban migration by whites, population density variations, and the location of schools relative to each other and to population distributions, how can the desegregation of schools be accomplished? A number of techniques are available and have been used by school officials in order to effectuate desegregation. Many of these techniques require that the decision-makers incorporate geographic components into the desegregation plans.

Freedom-of-Choice

As a result of the 1964 Civil Rights Act school officials faced the task of designing a desegregation plan that would comply with HEW guidelines. One plan offered by many districts to satisfy HEW requirements was some form of freedom-of-choice. The lack of success of this approach in bringing about desegregation has been alluded to earlier. This was an ineffective plan partly because the burden of desegregation fell primarily on blacks. Given the opportunity to choose their schools and their aversion for black schools, most whites chose existing white schools. Desegregation which did occur thus was primarily the result of decisions by black students and parents. But few blacks chose to attend schools where whites were in the majority.

Why under freedom-of-choice did so few blacks opt for desegregated schools? No doubt blacks feared the possibility of harassment by whites if they chose to attend white schools. However, one study of a freedom-of-choice plan revealed that a strong affinity by blacks for their own schools was more important than fear of attending white schools in their choice to remain at the black schools (Boulner and Vedlitz, 1971). In fact, when questioned about the quality of their schools compared to those of whites, black students rated their own schools superior. Some blacks who have attended desegregated schools also have expressed a preference for black schools. Black parents who were most likely to choose desegregated schools for their children ranked high on indices of knowledgeability, low on measures of alienation, and high on educational expectations (Binderman, 1972).

The open enrollment policy of the Baltimore City School System provided an example of the failure of a freedom-of-choice plan to produce a significant amount of desegregation (Solomon, 1973). Proximal regions were drawn for schools, and the percentage of the school's students who attended that school but who lived outside its proximal region was noted (Figure 16).

These percentages were used as indices of mobility for each school's enrollment. The most attractive schools, i.e., those with the highest percentage of mobile students, were relatively new, had a predominantly white faculty, and were located in higher socioeconomic status areas of the city. As expected, blacks exercised the freedom-of-choice more often than whites, i.e., they had a higher propensity than whites to attend schools outside their local neighborhoods. The decision of many whites to attend a school other than the one closest to their place of residence reflected an attempt to avoid predominantly black or racially integrated schools. Although black mobility tended to bring about some school desegregation, in contrast, the exercise of free choice by whites tended to further segregation. The net effect of these actions by blacks and whites was only a slight increase in the level of desegregation from what had existed prior to the beginning of the open enrollment policy. Overcrowding and undercrowding of facilities resulted from the exercise of free choice because of the differential attractiveness of various schools.

Redrawing Attendance Zones

Some school districts sought to respond to the *Brown* decision and later court and governmental actions by redrawing attendance zones to increase the level of racial mixing in schools. In areas where previous attendance zones had been gerrymandered to maintain segregation, it may have been possible to decrease segregation simply by relocating the attendance boundaries (Christian, Jakle, and Roseman, 1971). Frequently such areas were in locales of residential contact between the races. But because of the overall high levels of residential segregation that existed in urban school districts, rezoning had only limited utility in achieving desegregated schools. In fact, rezoning continued to be used after the *Brown* decision to maintain segregation.

Pairing, Clustering, and Feeder Techniques

Pairing of schools has been one of the most frequently used and effective techniques in urban school desegregation. The technique was in use well before the 1954 *Brown* decision in Princeton, New Jersey, and also has been referred to as the "Princeton" plan. When a black neighborhood and school were adjacent to a white area, it was possible to desegregate each school by contiguous pairing (Figure 17a). The former all white school could be designated to contain grades 1-3, and the black school enrolled grades 4-6. Thus, blacks in grades 1-3 were assigned out of their neighborhood to the former white school with a reverse assignment of whites in grades 4-6. Each school then reflected the combined racial proportions of the two neighborhoods. Of course, other grade structures could be used in the schools than 1-3 and 4-6. Contiguous pairing, however, has been restricted as a desegregation technique to areas where white and black neighborhoods were adjacent, and thus has had limited use. Because of housing patterns, a more frequent approach has been the pairing of noncontiguous school areas (Figure 17b). But this technique

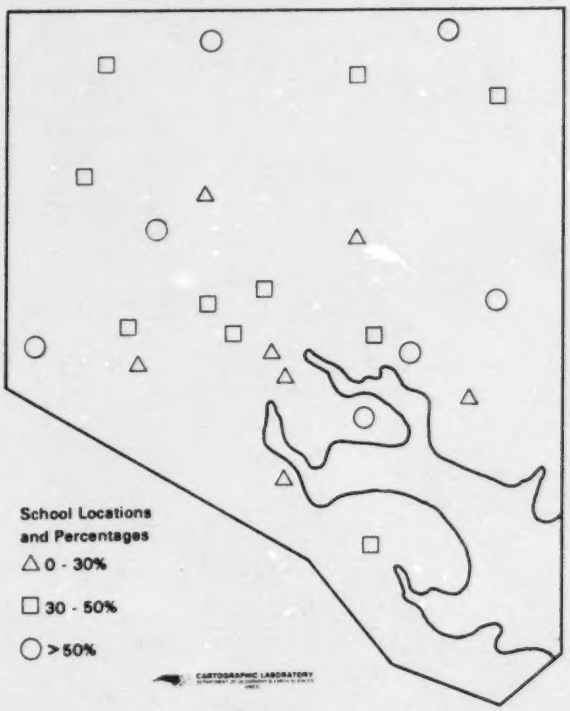

Figure 16. Percentage of Students Who Enrolled in the School But Resided Outside the School's Proximal Region, Baltimore City School System Open Enrollment Program, 1971-1972 (Source: Solomon, 1973).

requires busing and raises the controversies associated with busing.

The pairing technique has not been without its critics. Strong opposition frequently has come from parents of white students who have been assigned to distant and former black schools outside their local school area. One strategy employed to lessen this potential opposition has been to organize the former black schools to contain grades 4-6, with the white suburban school containing grades 1-3. This meant that the youngest white students did not have to attend a school outside their neighborhood, thus meeting less opposition by whites. This was only one of several ways that blacks had to bear a greater burden than whites in the desegregation process. Another strategy which has been used is to place an unequal number of grades in the two schools, such as grades 1-4 in the white school and grades 5-6 in the black school. Although this grade structure was justified perhaps in some situations by the racial proportions of the school system and the need to achieve some semblance of racial balance in each school, it also tended to minimize bus transportation for those school districts where whites were the majority. Since an arrangement such as this resulted in more bus transportation for blacks and a minimal amount for whites, it could be expected to produce less white resistance than a more equitable plan for both races (Bradbury, 1974).

A variant of the pairing technique is referred to as grouping or clustering. This strategy links three or more

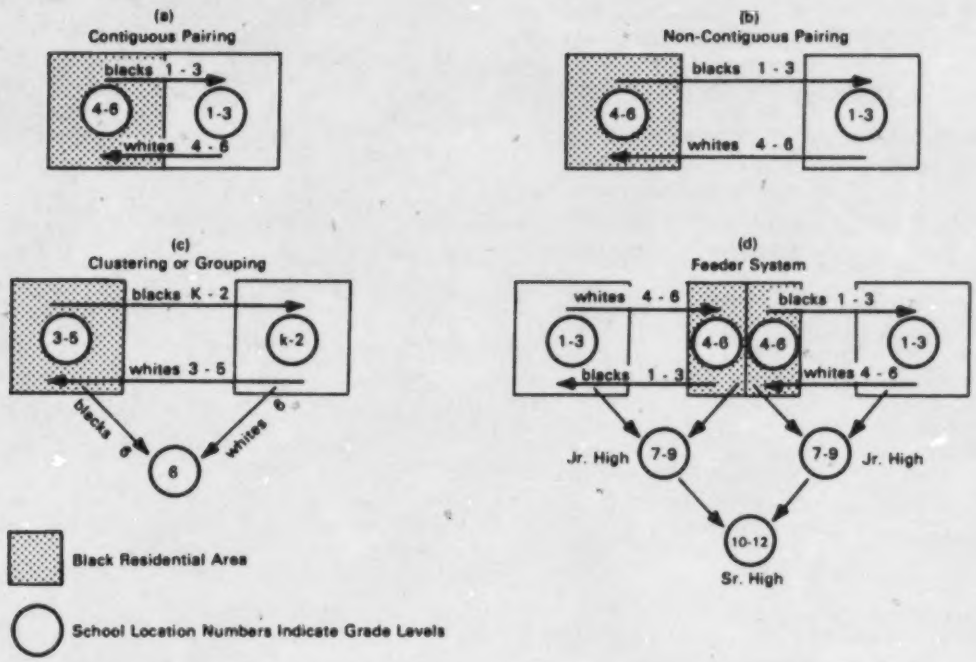

Figure 17. Techniques Used in Urban School Desegregation

schools together by student assignment patterns (Figure 17c). A grade organization might consist of a K-2 school in a white area paired with a 3-5 school in the black neighborhood and a third school containing only grade 6. Sixth grade students living in the white and black neighborhoods would be assigned to this latter school.

An extension of the clustering concept to encompass not only elementary grades but also junior and senior high schools results in what is termed a feeder system (Figure 17d). Pairs or groups of elementary schools feed into a smaller number of junior high schools with the latter then feeding into perhaps only one senior high school. The high school thus becomes the focal point of the feeder system. Professional educators look favorably upon one feature of this system—students remain together from grades 1-12. One can see that desegregation at the junior and/or senior high levels can be accomplished without the desegregation of the elementary schools as long as both black and white elementary schools feed into the junior and senior high schools.

Busing

Many of the desegregation techniques discussed above required the use of bus transportation, which in turn generated the "busing" controversy. But what is meant by the word "busing"? The use of buses to transport students to schools has been occurring for many years, and only a small percentage of those riding buses do so for desegregation purposes. Numerous instances exist in southern and border states where bus transportation has been used in the past to maintain rather than to eliminate segregated schools. A case in point was the segregated school system of New Kent County, Virginia (Green, 1968) where separate buses carrying blacks and whites met each day on the way to the two segregated schools.

Although busing may be defined generally as the transportation of students for the purpose of the desegregation or racial balancing of schools, we can offer a number of more specific variants of the general definition. To many whites busing meant the transportation of children to schools other than the ones they had attended prior to court-imposed desegregation. Others viewed busing as the transportation of students to schools other than those closest to their residential locations. Emphasis on this latter definition has been illustrated by attempts on the part of politicians to get a busing amendment passed that would require students to be assigned to the nearest or second nearest school. But even prior to the large-scale desegregation in the late 1960's and early 1970's, many white students were not attending the nearest school, especially if it happened to be majority black. Furthermore, the Constitution does not guarantee the right to attend the neighborhood school. A third variant of the definition was that busing involved the transportation of students to previously black schools frequently located in center city ghettos. It was not so much the bus ride or distance that whites opposed, but rather the destination of the bus. The title of an article by the NAACP, "It's Not the Distance, It's the Niggers," suggests that this third definition is one widely held by whites, although not openly admitted (NAACP Legal Defense and Educational Fund, 1973).

Magnet Schools and Open Schools

Some school districts have established "magnet" schools to bring about desegregation. The concept of the magnet school is that if the school is made very attractive educationally, parents will want to enroll their children despite the distance of the journey to school or the school's desegregated status. These schools frequently have been more of a hindrance than an aid in desegregation. Many whites have chosen more segregated magnet schools after being assigned to schools with large black ratios (Foster, 1973). The magnet concept also can lead to a dual system whereby schools are distinguished by the type and quality of educational programs.

Open schools also have not furthered desegregation. Although intended to provide an alternative educational method, these schools frequently have served as an escape for whites who wished to avoid mixing with large numbers of blacks. This occurred because of the difficulty in attracting blacks to open schools. Richmond school officials have viewed open schools as resegregation tools involving segregation both by class and race. Primarily middle- and upper-income whites and a small number of high-income blacks attended these schools. The response to enrollment in open schools appeared to be not so much a belief in their educational value, but a desire to be separated from those of a different class and race.

Spatial Allocation Models and School Desegregation

The use of spatial allocation models, especially the classical transportation problem of linear programming, provides another approach to school desegregation. Although these models generally have been used in geography and other disciplines to examine the flow of products from source areas to destinations, nevertheless, they can be used to analyze the movement of people—to assign students from residential areas to schools. In fact, the application of the linear programming transportation problem to the assignment of students to schools was demonstrated well before the emergence of the recent desegregation and busing controversy. Yeates (1963) used the transportation problem in assigning high school students for a school district in Wisconsin. He determined optimal school attendance boundaries that minimized total transportation cost to the school district. Then he compared these optimal school attendance areas to the actual attendance areas to determine where boundary changes could be made to increase spatial efficiency. This same basic model also can be used to design a desegregation plan for large urban school districts.

The spatial dimensions of the school desegregation and busing problem include the residential location of students by race, the location of schools with their corresponding enrollment capacities, and the time, travel cost, or distance separation of student residences and school locations. Furthermore, one can view the enrollment of each school as requiring some mix of white and black students to conform to desegregation requirements.

TABLE 3. DATA MATRIX FOR TRANSPORTATION PROBLEM OF LINEAR PROGRAMMING

Location of Students (Areas)	Location of Schools 1	2	3	j	m	Number of Students in Each Area
1	C_{11}	C_{12}	C_{13}	C_{1j}	C_{1m}	a_1
2	C_{21}	C_{22}	C_{23}	C_{2j}	C_{2m}	a_2
3	C_{31}	C_{32}	C_{33}	C_{3j}	C_{3m}	a_3
i	C_{i1}	C_{i2}	C_{i3}	C_{ij}	C_{im}	a_i
n	C_{n1}	C_{n2}	C_{n3}	C_{nj}	C_{nm}	a_n
Capacity of Schools	b_1	b_2	b_3	b_j	b_m	Total Number of Students

Model Formulation and Notation

The transportation problem can be stated generally as the following: (1) There is a set of origins with known supplies available for shipment; (2) There is a set of destinations with known demand requirements; (3) What is the least cost pattern of transporting supplies from the origin areas to the destinations or demand locations (primal solution); (4) What are the advantages or disadvantages, from a locational viewpoint, of the various origin areas and destination locales (dual solution)? This general framework can be made specific to the school desegregation and busing problem. The origin areas correspond to residential areas within a city or school district. The number of students by race who reside there represent the supplies of these areas. School locations serve as the destination points for the transportation of students. The demand for each school can be stated in terms of its enrollment capacity and a required ratio of white and black students. Such measurements as travel time or distance can be used as the transportation cost input to the model. Student residential locations are aggregated into regions and the transportation cost matrix assumes the dimensions of $i \cdot j$ where i represents the number of residential areas and j the number of schools. Table 3 presents the general form of the data matrix necessary for the solution of the transportation problem.

The objective function of the model is to minimize the total transportation cost (or distance or travel time) in transporting students from the residential areas to school locations. This objective function can be written symbolically as follows:

$$(1) \qquad \sum_{i=1}^{n} \sum_{j=1}^{m} S_{ij}C_{ij} = \text{Minimum}$$

where

S_{ij} represents the number of students transported from i^{th} residential area to the j^{th} school.

C_{ij} represents the cost involved in transporting students from the i^{th} residential area to the j^{th} school.

The objective function is subject to the following constraints:

(2) $$\sum_{j=1}^{m} S_{ij} = a_i$$ where

a_i represents the number of students residing in the i^{th} residential area.

(3) $$\sum_{i=1}^{n} S_{ij} = b_j$$ where

b_j represents the enrollment capacity of the j^{th} school.

Constraint (2) indicates that the number of students transported from the i^{th} residential area to the various schools cannot exceed the number of students residing in that tract. Constraint (3) indicates that the number of students transported to the j^{th} school from one or more residential areas cannot exceed the capacity of the school. In addition to this general constraint regarding the enrollment capacity of the school, it is also possible to specify ratios for each school and thus define further the school capacity constraint in terms of numbers of white and black students. Another constraint may also be specified:

(4) $$\sum_{i=1}^{n} a_i = \sum_{j=1}^{m} b_j$$

This equation indicates that the total number of students to be transported must equal the combined capacities of the schools, i.e., equal supply and demand. This latter constraint can be circumvented by generating extra row and column slack to compensate for the inequality. In fact this option can greatly enhance the analytical capability of the model.

Application of the Model

The applicability of the transportation problem as a desegregation technique perhaps can be illustrated best with a hypothetical school district. Assume that this hypothetical district contains six schools of a given grade structure and that there are 3,125 students who are to be assigned to these six schools. Assume further that the racial mix of students in this total of 3,125 is approximately seventy percent white and thirty percent black, or 2,188 white students and 937 black students. The residential distribution of students by race and the locations of the six schools are indicated in Figure 18.

The location of the students by race is typical of the pattern in many cities, i.e., a spatial concentration of blacks in the central area of the city and a lower density and predominantly white population in the peripheral residential areas. All schools except West are assumed to be located in the center of a residential subarea. The six schools differ in their enrollment capacities and these values along with the number of white and black students that would produce a seventy-thirty black-white ratio in each school are presented in Table 4. The transportation cost matrix was developed by calculating the distance from the geographic center of each of the thirty

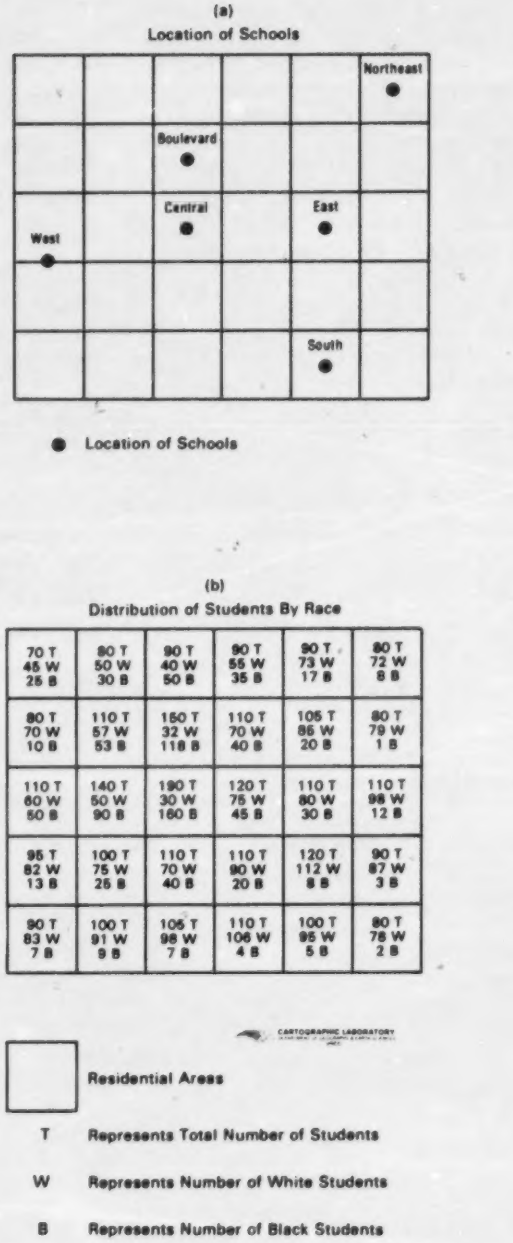
(a)
Location of Schools
Northeast
Boulevard
Central
East
West
South
Location of Schools
(b)
Distribution of Students By Race
70 T 45 W 25 B
80 T 50 W 30 B
90 T 40 W 50 B
90 T 55 W 35 B
90 T 73 W 17 B
80 T 72 W 8 B
80 T 70 W 10 B
110 T 57 W 53 B
150 T 32 W 118 B
110 T 70 W 40 B
105 T 86 W 20 B
80 T 79 W 1 B
110 T 60 W 50 B
140 T 50 W 90 B
190 T 30 W 160 B
120 T 75 W 45 B
110 T 80 W 30 B
110 T 98 W 12 B
95 T 82 W 13 B
100 T 75 W 25 B
110 T 70 W 40 B
110 T 90 W 20 B
120 T 112 W 8 B
90 T 87 W 3 B
90 T 83 W 7 B
100 T 91 W 9 B
105 T 98 W 7 B
110 T 106 W 4 B
100 T 95 W 5 B
80 T 78 W 2 B
Residential Areas
T Represents Total Number of Students
W Represents Number of White Students
B Represents Number of Black Students

Figure 18. Location of Schools and Residential Distribution of Students by Race for Hypothetical School District.

residential areas to the six schools, a total of 180 distance values.

Primal Solution

Several different versions of the transportation model were executed in order to assess the impact on assignment patterns and transportation cost of changing various constraints. The first model assumed that there were

no capacity or racial mix constraints in any of the schools. The effect of removing these constraints was that students were assigned to their closest schools, producing a system of neighborhood schools. The assignment pattern from this solution was thus the most spatially efficient one possible given the location of students and schools. The total transportation cost associated with the model was 6,515 units, a lower cost figure than occurred for any of the other models where capacity and/or racial ratio constraints were used. However, this model resulted in large differences in enrollment levels in the six schools, thereby producing problems of overcrowding in some schools and the underutilization of others. Also, because there was racial residential segregation and no racial ratios were required, assignments based on the model produced segregated schools. The black percentage in the six schools varied from a low of less than four percent in South to more than forty-five percent in both Boulevard and Central.

A second model was solved that had the same objective function as the first model but, in addition, incorporated an enrollment capacity constraint for each school (see Table 4). However, no requirements as to racial mix were established. Once again the solution produced neighborhood schools except as affected by constraints on enrollment capacity. The total transportation cost of the assignments was 7,131 units or an increase of 9.5 percent over the assignment plan when no capacity constraints existed. The average transportation distance per student under the second model was 2.28 units, compared to only 2.05 units for the first model. Also, in the second model 4.5 percent of the students were not assigned to the nearest school.

A third model was solved in order to demonstrate the impact of both an enrollment capacity constraint and a racial mix requirement on various aspects of the assignment plan (Figure 19). Given the segregated housing patterns which have been assumed, one would expect this third model to have a higher transportation cost than the first two models. Indeed, transport costs increased to 7,971 units, an increase of twenty-two percent from the first model and 11.8 percent over the second model. The average transportation distance per student was 2.55 units. In addition, twelve percent of the students in this model were not assigned to the nearest school, compared to 4.5 percent in the second model.

Important differences in the assignment patterns existed between white and black students. The average

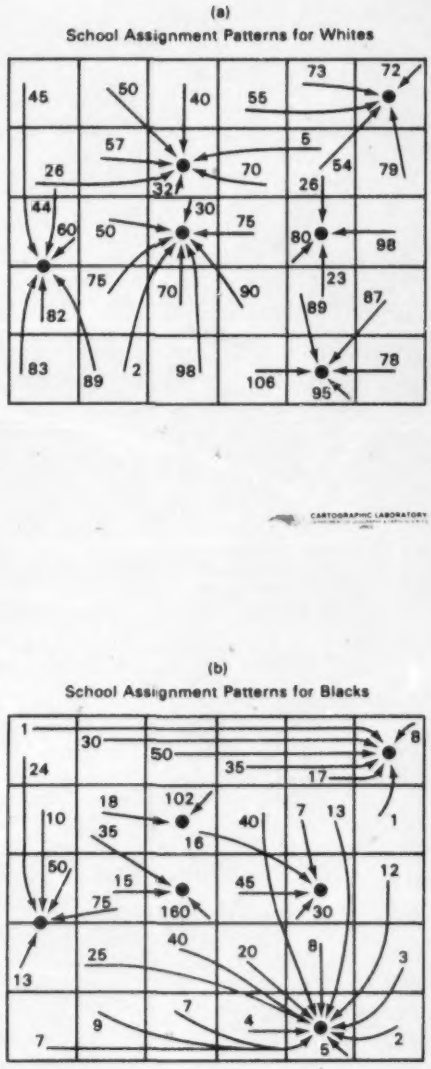
(a)
School Assignment Patterns for Whites
(b)
School Assignment Patterns for Blacks
Figures indicate the number of students assigned from each residential area to each school.
Location of Schools

Figure 19. Minimum Transportation Cost School Assignment Patterns with Constraints on Enrollment Capacity and Racial Mix.

TABLE 4. ENROLLMENT CAPACITIES AND RACIAL MIX REQUIREMENTS FOR SCHOOLS

Schools	Total Capacity	Number of Whites	Number of Blacks
Central	700	490	210
Boulevard	400	280	120
East	325	227	98
South	650	455	195
West	575	403	172
Northeast	475	333	142
Total	3125	2188	937

transportation distance for white students was 2.39 units, compared to 2.92 units for blacks. A total of only four percent of the white students were not assigned to the nearest school in comparison to a value of thirty-one percent for black students. These differences are well illustrated by comparing the residential source area for South school. Although whites who were assigned to this school came only from adjacent residential areas, the source region for blacks was much larger and included several very distant areas that were closer to other schools. This disproportionate amount of transportation placed upon blacks in terms of longer distance assignments and fewer assignments to the nearest

schools emphasized the spatial concentration of black student residences relative to a more dispersed pattern for whites. Thus a more dispersed black population, i.e., more integrated housing patterns, would have reduced the amount of transportation (or busing) necessary to desegregate schools.

Impact of Constraints

Although the exact values obtained in the various models should be viewed as specific only to the hypothetical data utilized in the models, in a more general sense the results can be extended to many actual desegregation situations. Similar results have been obtained by other authors utilizing hypothetical school districts different from the one in this paper (Kuz and Ziegler, 1971; Stimson and Thompson, 1974). The value of using several models is that it allows one to examine the effects of changes in the parameters of the model upon assignment patterns.

Use of a similar model for the elementary schools of Gainesville, Florida revealed that the miles of bus transportation increased by twenty percent when a racial balance constraint was added, compared to the optimum assignments with no racial balance (Belford and Ratliff, 1972). Smaller increases occurred when the model was solved for middle schools and high schools. This was largely because of the lesser number of schools at these grade levels and their larger attendance zones.

The above models illustrate the impact on transportation costs of changing enrollment capacities and racial ratio requirements. A flexible enrollment capacity results in lower transportation costs as school enrollment levels can be adjusted to population density patterns (see Maxfield, 1972). Also, strict racial ratios in each school, such as the overall ratio for the entire school district, increase costs compared to the absence of these ratios. A number of allocation models have set upper and lower bounds on the racial proportion of blacks in the schools (see Stimson and Thompson, 1974; Franklin and Koenigsberg, 1973; Heckman and Taylor, 1969; Clarke and Surkis, 1968). The establishment of a minimum and maximum limit on the black ratio in each school allows the assignment routine to take advantage of racial housing patterns. A school in a black residential area can be assigned a higher black proportion than a school located in a predominantly white area.

Other constraints can also be incorporated into the assignment model. For example, it may be desirable not to make assignments which exceed some maximum distance or time. The users of the assignment model could set an artificially high cost on assignments which they do not want to be made (Heckman and Taylor, 1969). Long-distance assignments could also be reduced by using distance squared in the model. This modification has the effect of making long-distance assignments especially costly and generally will result in more compact attendance areas for schools (Franklin and Koenigsberg, 1973). However, a trade-off occurs between the number of long-distance assignments and the total distance traveled. Although the use of distance squared reduces the number of long-distance assignments, it can increase the total distance or cost of the assignments (Stimson and Thompson, 1974).

Another type of trade-off could take place between spatial efficiency and equity. A minimum cost assignment pattern usually results in unequal amounts of transportation for the two racial groups and different amounts for various whites or blacks. Any assignment plan which seeks to reduce these inequities no doubt produces a less efficient plan from the standpoint of transportation costs. The local federal judge opposed the initial solution of a computer model of pupil assignment for the Corpus Christi, Texas School District because too few residential areas and students would have been required to bear a major part of the busing burden (Dolezal, Cross, and Howard, 1976). Subsequently, the district implemented a modification of the computer plan that equalized bus transportation among the students.

Dual Solution

The primal solution to a linear programming transportation problem indicates the optimum assignment pattern of students to schools, i.e., the pattern which satisfies the objective function. Each linear programming model also has a second solution known as the dual (Scott, 1971). Values are computed for the origins (residential areas) and destinations (schools) which represent the competitive advantage of one location over another. These values have been referred to as marginal values, shadow prices, or location rents. Of special interest in the school assignment problem are the dual values for the school locations. These values indicate the amount of change in transportation costs that would accompany the shift of one unit of capacity from one school to another. Thus the dual solution is of interest to planners and administrators in that it indicates how the capacity levels or racial mix constraints of schools can be changed in order to reduce transportation cost. One practical use of such values is to increase the capacity of schools with high location rents by the addition of portable classrooms.

Limitations

A number of conditions limit the use of spatial allocation models in actual school desegregation efforts. First, they require large data bases including detailed information on the residential locations of students by race, and transportation costs in terms of distance or travel time between residential areas and school locations. Such data frequently either are not available or are difficult to obtain. Certainly one of the consequences of school desegregation has been the need to collect and analyze large amounts of information about student locations. Second, it is difficult for many lay people, including parents, to understand sophisticated computer models which deal with pupil assignment. They may also oppose the impersonal approach to student assignment by the computer. The school desegregation plan should not be viewed simply as a desegregation problem, i.e., the physical mixing of races. Such a view has frequently

been described as the approach often taken by operations researchers (Stimson and Thompson, 1975). Others, such as sociologists, psychologists, and educators have viewed school desegregation as an integration problem of great importance to the larger goal of a multiracial society. Certainly any approach to school desegregation should incorporate as broad a view of its long-term merits as possible. As with any desegregation effort, the student assignment plan faces many political realities as evidenced by strong reactions that arise from parents and various interest and pressure groups.

Such models should be more than teaching or analytical devices to illustrate the importance of factors such as residential patterns and school locations in pupil assignment. They have a practical value and at the least can provide a useful starting point in the task of designing desegregation plans. Furthermore, the cartographic results of linear programming models can be shown for any school district, thus providing parents and school board members with observable patterns.

The implementation of desegregation and busing has produced a number of unintended impacts. The political and demographic ramifications of these actions will be discussed in the next section.

V. POLITICAL AND DEMOGRAPHIC RAMIFICATIONS

Both internal (e.g. demands by blacks) and external (courts and government agencies) pressures have been brought to bear upon school districts to desegregate. Controversy created by these demands and the implementation of desegregation accompanied by busing have produced impacts upon the electoral arena, the schools, and the demographic patterns of the school district.

Electoral Geography

School Board Elections

Within the electoral arena the impact of desegregation has been manifested in a number of ways, including greater political participation via voter turnouts and the polarization of the community on the desegregation and busing issue. School board elections provide good illustrations of these two impacts. Polarization has taken place between proponents of desegregation on the one hand and the antibusing or desegregation foes on the other. As the school board is frequently the principal decision-making body and therefore legally responsible for desegregation, it is no surprise that such elections have become a center of attention in desegregating school districts.

The May 1970 school board election in Charlotte, North Carolina followed a 1969 federal district court order to desegregate, and preceded by only four months the beginning of full-scale desegregation in the school district. Thus it is an ideal election to use in an examination of the impact of the desegregation and busing issue. The election campaign revolved around only one issue, that of desegregation, and the word "busing" became the battle cry. A group of citizens opposed to desegregation and busing came together under the name Concerned Parents Association or CPA and sought community support for their cause. The CPA was well-organized and visible and thus became a significant factor in the election. Their alternatives to court-ordered desegregation were the retention of freedom-of-choice and the neighborhood school. Many voters assumed that they could prevent court-ordered desegregation by electing candidates with antidesegregation views. What many voters failed to realize fully was that school officials, i.e., school boards, were under a judicial mandate to desegregate, and the school board was left with little jurisdiction.

The outcome of the election was a victory for the CPA and busing opponents, as all three CPA endorsed candidates were elected. The three candidates received fifty-three percent of the total votes in an election involving thirteen candidates illustrating the strength of the antibusing vote. In comparison, the three incumbents who were defeated received only thirty-three percent of the votes. Figure 20 presents the spatial pattern of support for the antibusing candidates and indicates quite clearly the polarization of the community. The spatial pattern of antibusing sentiment was related closely to racial and income characteristics of the voting precinct areas. The strongest support for the antibusing candidates came from precincts containing large numbers of lower- and middle-income whites. These precincts were located in the northeast and northwest areas of the city and in suburban and rural county locations. As one might expect, the lowest support for antibusing candidates came from black precincts. One of the defeated incumbents was black. The high-income southeast sector of the city gave an intermediate level of support to the antibusing candidates.

The support of the CPA-endorsed antibusing candidates by lower- and middle-income whites was to be expected. These groups probably felt more threatened by desegregation. Working-class whites in the past have expressed stronger segregationist sentiments than other groups. Many blacks no doubt supported desegregation because they felt that it would have positive con-

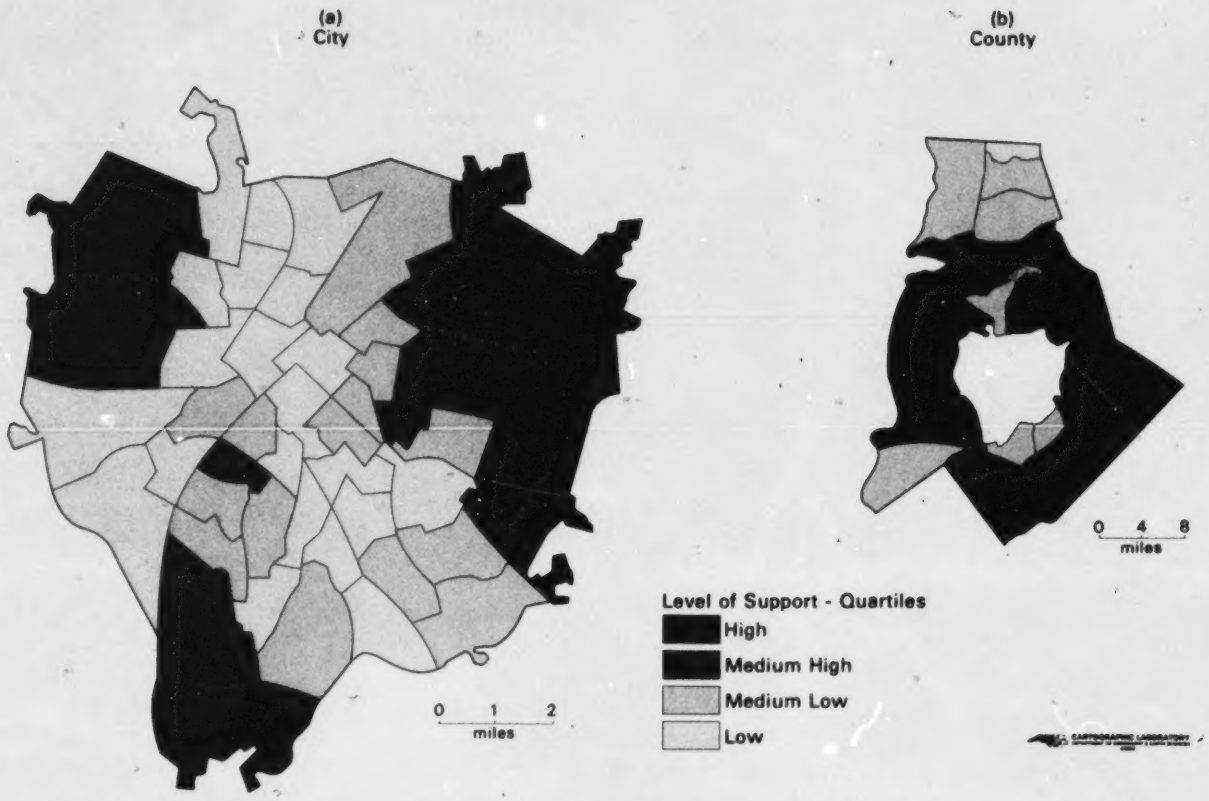

Figure 20. Voting Support for Antibusing School Board Candidates, Charlotte-Mecklenburg, 1970 (Source: Adapted from Lord and Catau, 1976).

sequences for the quality of their schools. On the other hand, busing was not as important an issue to high-income whites. Households in this group had the financial means to avoid any undesirable desegregation and busing by removing their children from the public schools and enrolling them in private schools. Traditionally, whites of higher socioeconomic status have shown more support for integration issues than lower status groups.

Those precincts that most strongly opposed busing were many of the same areas that gave the least amount of support for downtown urban renewal in a 1966 city referendum which narrowly passed by a fifty-one percent vote (Hoffman, 1970). Also, those precincts voting most heavily for antibusing candidates in 1970 were the same areas that gave George Wallace his strongest support in the 1968 presidential election and in the 1972 North Carolina Democratic presidential primary. In fact, the correlation between the antibusing vote in the 1970 school board election and the 1972 George Wallace vote was +.91.

It is interesting that busing as an election issue had a rather short life in the Charlotte-Mecklenburg school district. Another election was held in 1972 to fill three additional seats on the school board. Candidates with antibusing views did not fare nearly as well in this election, with three such candidates receiving only 18.6 percent of the votes. Neither of the three received a sufficient number of votes to be elected. It may be noted that the 1972 antibusing vote, although much smaller in magnitude, exhibited a very similar geographic pattern to the 1970 vote. The correlation using precinct level data was +.85. The continued waning of the busing issue was further verified by the 1974 election. Concern had shifted away from continued opposition to busing to establishing a fair and stable desegregation plan thus not requiring year-to-year changes in school assignments. In the 1976 election, school desegregation and busing did not emerge among any of the candidates as an issue.

The patterns of acquiescence of the antibusing movement that occurred in Charlotte-Mecklenburg have been repeated in other school districts. Protests waned when the antibusing supporters estimated the probable efficacy of their actions. The courts seem to have won the battle in this regard, as they have not yielded to the public protests.

Other school districts have had similar experiences regarding the desegregation controversy and school board elections. The 1969 school board election in the Richmond Unified School District of northern California had school desegregation as the principal issue (Rubin, 1972). The April 1969 school board election in Denver, Colorado also represented a contest between the proponents and opponents of busing. The result was much the same as in Charlotte and Richmond in that the

antibusing candidates won overwhelmingly with a more than two to one margin over probusing candidates (Jackson, 1971).

The desegregation controversy also has affected voter participation. In the 1969 Richmond, California school board election sixty-seven percent of the electorate voted, compared to only thirty-seven percent two years earlier. Previously such local elections had generated relatively little interest, as evidenced by low turnouts and little competition among candidates. An investigation of the effect of school desegregation on electoral politicization as measured by turnout in a sample of fifty-eight northern cities (Rossell, 1975) found that school desegregation did increase voter turnout. Its effect was not evident until the impact of concurrent elections was controlled. One might have expected a greater politicization effect if southern cities had been examined because of stronger racial attitudes as well as the greater degree of desegregation in the South.

National Politics

The impact of the desegregation and busing issue has not been limited to the local political arena. It certainly became a national political issue in the early 1970's. Busing resolutions appeared on election ballots in a number of states and presidential primary candidates made it an issue. The Florida presidential primary in March 1972 served to focus national attention on busing by including a busing referendum on a ballot. The result was that seventy-four percent of the voters favored prohibiting busing. George Wallace, the candidate with the strongest antibusing views, received forty-two percent of the votes in a large field of eleven candidates. Every single county in the state favored prohibiting busing with the vote varying between fifty-two percent and ninety-one percent (Brunn, 1974). Soon after the Florida primary, President Nixon proposed to halt for one year all new busing and to halt indefinitely the busing of students below the seventh grade. In lieu of busing he proposed large amounts of federal aid to segregated inner-city schools.

Many members of Congress have been torn between the mandates of the courts and the outrage of parents. A frequent result of this conflict was that the politicians sided with the parents (Havemann, 1972). The Michigan delegation to the U.S. House of Representatives illustrated a dramatic turnabout on the busing issue. In 1970 the delegation voted eighteen to one against busing restrictions, but two years later voted fifteen to three favoring curbs on busing. In fact, fifty-seven members of the House of Representatives who voted against busing restrictions in 1970 and 1971 voted for similar restrictions in 1972. Busing certainly is no longer the front-page issue it once was. But one suspects that it is on many people's minds and it is ready to be brought forward when circumstances may warrant.

Other Electoral Impacts

The controversy surrounding desegregation also has affected the electoral process on such referenda as tax support for school districts and city and county consolidation. The working class typically has not supported these referenda issues. Their support may have been further diminished whenever the referenda were related to the school desegregation controversy.

Frequently additional costs accompany school desegregation and busing, although these costs are not related solely to the increase in the use of bus transportation. Thus attitudes toward desegregation might be expected to influence attitudes toward a tax levy to support schools. A study of a racially integrated suburban school system found that a favorable vote by whites for a tax referendum to support the school district's budget was related to family income level, parental versus nonparental status, and a favorable attitude toward school integration (Sichel, 1975). The favorable attitude toward integration was itself correlated with higher income and parental versus nonparental status. Partial correlation analysis revealed, however, that the positive relationship between a favorable tax vote and a favorable attitude toward integration remained after controlling for income and parental status.

School Desegregation and White Flight

The spatial pattern of antibusing sentiment such as that represented in Figure 20 may not only indicate opposition as expressed through the electoral process but it also may reflect a surface of conflict which manifests itself in terms of a response such as school desegregation related "white flight." It is to this topic that we now turn.

White Flight and Desegregation Policy

The answer to the question of whether or not school desegregation produces a significant amount of white flight has very important implications concerning the efficacy of school desegregation policy. One of the key factors here is the magnitude of flight precipitated by desegregation. If this magnitude is large, then school officials need to look closely at desegregation policy. This is not to say that desegregation efforts should be abandoned because they produce white flight. Rather, it suggests that there is a need to explore various alternative strategies that might minimize the magnitude of white flight.

A number of potential negative consequences related to school desegregation and white flight can be mentioned here. Please note that these impacts are only suggested as possibilities. Desegregation may lead to a resegregation between school districts if whites abandon large central city systems for the surrounding suburban districts which have much lower percentages of blacks. It is also possible that desegregation plans stimulate intradistrict residential relocation decisions as white households seek to avoid undesirable school assignments for their children. Heavy white losses, especially middle- and high-income groups, also can erode community support for public schools. The withdrawal of children of high-income families from public to private schools may reduce the beneficial effects for our society

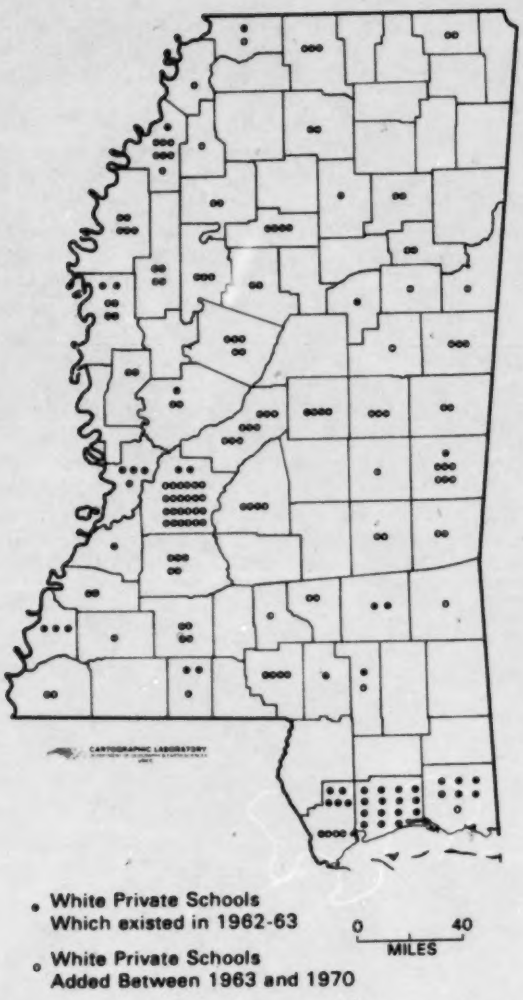

Figure 21. Location of Private Schools in Mississippi, 1970 (Source: Adapted from Lowry, 1973).

that accrue from social contacts and interactions among students of different cultures and classes. Thus it is important to focus attention upon the relationship between school desegregation and white flight in order to determine their impacts. The following sections seek to provide some insights on this important question.

Forms of White Flight

White flight resulting from school desegregation actions can be manifested in two forms. First, there is the abandonment of public schools and enrollment in private schools. This form of flight can be identified fairly easily by examining enrollment trends in public and private schools both before and after desegregation. Certainly this form of white flight has occurred and in significant amounts in some localities. The implementation of desegregation in Mississippi following the 1969 *Alexander* decision brought about the emergence of many private white academies specifically to maintain segregated schools (Figure 21). Note the correspondence between the location pattern of private schools and that of the black population (see Figure 7). Private school enrollment in Mississippi increased by almost one hundred percent between 1968 and 1969 (Figure 22). This strong increase continued in 1970.

The second form of white flight is a locational response, i.e., residential movement of households. This migration response has been viewed typically as the movement of white households from large, desegregating districts to nearby suburban areas. Such a process, if it involves primarily whites, has important implications for the racial stability of cities. One might view the residential migration form of white flight as more important than flight to private schools because of the former's long-term effect on the segregation of housing and various social institutions. This form of white flight, like that to private schools, manifests itself in a decline in white enrollment for the school district. However, a variant of this form of white flight may exist which involves residential migration but does not result in a loss of white students for the desegregating district. This process involves residential migration actions that are intradistrict in nature (Lord and Catau, 1977). This would appear as a real possibility if the desegregation plan creates school assignment patterns which favor certain areas. For example, the burden of bus transportation for desegregation may fall more heavily on some residential areas than others (see Figure 10). Whites might be able to escape a busing assignment or an assignment to an undesirable school, such as one with a large black ratio, by moving to another neighborhood and attendance zone within the same school district. Realtors may have aided parents in such movement decisions. In fact, during the peak of the busing controversy in Charlotte, North Carolina, some newspaper ads for house sales indicated no busing for the neighborhood.

The residential migration form of white flight is considerably more difficult to identify or document than the private school response. This difficulty arises because many factors are involved in residential migration decisions, and it is difficult to identify the separate influence of desegregation. Many school districts, especially those of large central cities, were losing white students even

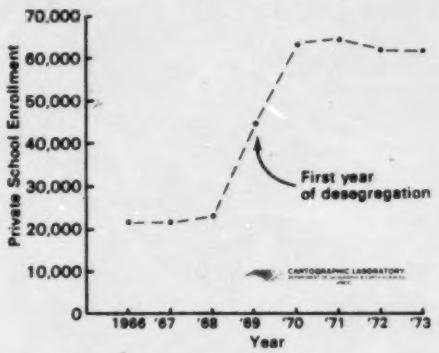

Figure 22. Private School Enrollment Trends in Mississippi, 1966-1973 (Source: Data obtained from Clotfelter, 1976).

before desegregation. Thus we cannot automatically attribute white losses that occur during a period of desegregation to desegregation itself. A recent study of residential migration from a large southern school district revealed that several factors were of equal or greater importance than desegregation or busing in the relocation decision (Lord and Catau, 1976). These factors included desire for more open space, perceived greater safety and less threat of crime in surrounding districts, and lower property taxes in areas outside the large school district.

White Flight Decision-Making

The choice by white households between public and private schooling in a desegregated school district can be viewed as affected by the household's income, its preferences or attitudes regarding school segregation, and the price or cost of private schooling (Clotfelter, 1976). These factors suggest that a trade-off takes place among the decision-makers. If the household decides to flee the public schools and enroll its children in private schools, it has traded the disutility of attending desegregated public schools for the reduced consumption which results from largely segregated private schools. Income can be viewed as modifying the effect of desegregation on white flight to private schools in that the higher the income level of a household the more likely such a trade-off would take place, i.e., higher-income households would be affected less by reduced consumption that results from the cost of private schooling.

Lower- and middle-income whites ordinarily find it difficult to make this trade-off because of the cost of private schooling, although they may have a strong preference for segregated schools. It is possible, that if the household's preference for segregated schools is strong enough, it may incur a substantial financial burden in order to send the child to the private school. Many private schools in the South run by conservative churches have eased this financial burden with moderate tuition levels. There are also other examples of private schools not associated with churches which have moderate tuition levels in order to attract lower-middle-income whites. But private schools largely remain an option that only the more wealthy can exercise.

There may be another alternative for lower-middle-income households who find the high cost of tuition payments prohibitive to sending their children to private schools. This alternative or strategy may involve residential relocation of the household to another school district or to another location within the same district. The Tiebout hypothesis has been used as a conceptual framework for the analysis of such residential shifts (Clotfelter, 1975). This hypothesis states that consumer-residents choose to locate in areas which best satisfy their preferences for public goods and services. In the context of school desegregation and white flight, one would expect those households which have strong preferences for segregated schools but which cannot afford private schools to relocate in adjacent school districts where court-ordered desegregation or forced busing does not exist, or to locate in areas within the desegregating district which are not affected by the desegregation plan. The result is a spatial rearrangement of those households having a preference for segregated schools or lesser desegregated schools.

Also for those who prefer segregated schools, the disutility of desegregated schools may increase as the black ratio of the schools increases. For a given household income level and private school tuition cost, there may be a level of public school racial composition where the household is indifferent to public vs. private schools, i.e., a point of equilibrium. Beyond this threshold value for the black ratio, the disutility of desegregated schools exceeds that resulting from reduced consumption because of private school tuition payments. This critical black ratio may vary according to the factors of household income level, intensity of racial prejudices, and private school tuition costs. Assuming comparability between two households in terms of racial prejudice, one might expect the black ratio threshold to be lower for high-income households than low- or middle-income households. One could also assume that the black ratio might affect the residential migration form of white flight.

In summary, white flight would appear to be most likely among high-income households as well as those with strong preferences for segregated schools. In the next section we will examine data on white flight with particular attention to the roles that school desegregation and the black ratio of the school district play in this phenomenon.

Correlates of White Flight

Recent controversy has arisen as to whether school desegregation produces a significant amount of white flight. The major stimulus for this recent controversy was created when a study of a sample of large urban school districts in the United States concluded that desegregation had accelerated the loss of white students (Coleman, 1975b). Others have suggested that the composition of the sample in this study was designed to show the maximum impact of desegregation on white loss (Farley, 1975a; Pettigrew and Green, 1976). The opposing view has suggested that either (1) white flight has not been a significant consequence of desegregation and busing, or that (2) in those districts where white student losses have occurred, they were for the most part short-term, of varying proportion in different school districts, and perhaps more strongly related to the black ratio of the school district or schools and to general suburbanization trends than to desegregation actions.

An examination of the available data and research would lead this writer to the following conclusion regarding the controversy. School desegregation and related busing have produced white flight, but the impact has varied widely from one school district to another, ranging from a small impact in some districts to a considerably larger and more significant effect in others. The data certainly do not support the generalization that desegregation has triggered "massive" white flight.

There are a number of variables or conditions that cause a difference in the magnitude or intensity of white

flight among school districts. These variables pertain not only to the desegregation actions but to socioeconomic and demographic characteristics of the community as well.

Generally speaking, the greater the degree of desegregation the more white flight would occur. However, one may not be able simply to collect data for a sample of cities on the change in white enrollment and the change in school segregation and then correlate the two variables in order to ascertain that relationship. Other factors may be related to white loss other than just desegregation, and these factors may disguise the relationship unless they are controlled for. One of the common problems of the studies which have used a cross-sectional approach (i.e. comparing situations among a number of different cities or school districts) is the difficulty of including in the regression model all the appropriate variables and the need to examine the various relationships while controlling for the effects of other variables. A case in point is the correlation between percentage change in white enrollment between 1967 and 1972 and change in school segregation during the same period for the twenty largest urban school districts in the South (Farley, 1975a). The simple correlation coefficient was −.43, indicating that the largest white losses occurred in districts that experienced the least amount of reduction in school segregation. This result does not support the assumed relationship, but rather represents the reverse. However, if other independent variables are included in the analysis, and the effects of these variables are controlled for, a reversal in the relationship occurs. The partial correlation between change in white enrollment and change in school segregation is +.43 when one controls for the factors of general population change (average annual population growth rate for the school district area between 1960 and 1970), the black ratio of the school district, and whether or not the district is a central city school system or whether it is countywide (frequently referred to as a metropolitan system). Another analysis of all school districts in the United States with more than 75,000 students at first glance might lead one to reject the inference that school desegregation produces white flight (Figure 23). But, as stressed above, one should be careful in stating such a conclusion when examining only the simple correlation effect.

The measurement of school desegregation also may present some problems in the study of white flight. The studies cited above have measured this factor in terms of the change which occurs in a school segregation index over some time period. Once could use a measurement such as the index of dissimilarity for this purpose. Two school districts might experience the same amount of reduction in the segregation index, i.e., the same amount of desegregation, yet the specific plans used to bring about the desegregation could be quite different. For example, in one school district desegregation might be achieved primarily by closing many previously all black schools and busing the blacks to white schools. In another district perhaps a more equitable plan for the two racial groups may have been used, i.e., one that equalized the busing of blacks and whites. It is suggested that a greater amount of white flight would occur in the latter school district. One study has indicated that the rate of white abandonment of public schools was accelerated whenever students from white middle- and upper-income neighborhoods were bused from their neighborhoods to a distant, formerly black school (Lord, 1975). In comparison, whites did not abandon public schools as rapidly when blacks were bused into schools located in white neighborhoods. Thus, whites appeared to be more willing to integrate with blacks in schools located in white neighborhoods than to be bused to schools located in black residential areas.

The white flight response produced by desegregation actions also may vary depending upon which whites are involved in the desegregation process. As indicated above, two important factors are the income level and attitudes of the whites. The busing of high-income whites would be expected to maximize flight to private schools. Although lower-income whites cannot respond in this manner, the residential migration response is an alternative. Thus, the relative importance of the two forms of white flight and their respective magnitudes may depend upon the degree to which various segments of the white community are involved in the desegregation plan.

Earlier it was pointed out that white student losses in school districts are affected by many factors associated with the widespread trend in U.S. cities of suburbanization and that one should not automatically attribute losses in desegregated districts to school desegregation. Although this relationship is widely recognized, few studies have included a variable which would control for this general suburbanization trend. By controlling for this trend, however, one would be in a better position to assess the specific effect of desegregation on the white loss.

One possible way of controlling for this general population change factor would be to include in the regression model a variable such as the average annual growth rate of the school district's population over a span of years prior to desegregation. It was found that for the twenty largest school districts in the South, the change in white enrollment between 1967 and 1972 was more highly correlated with the average annual growth rate between 1960 and 1970 of the districts' total population ($r = +.72$) than to any of several other factors which were deemed important. In fact, the importance of some of these other factors was not apparent until controlling for the general population trend.

In view of the fact that white losses were occurring in many school districts even before desegregation, a useful approach which would help avoid the problem discussed above would be to analyze white enrollment trends both before and after desegregation (see Rossell, 1975-1976; Bosco and Robin, 1974). If desegregation does produce substantial white loss, then one would expect an upsurge in this loss coincident in time with desegregation actions. A study of the Kalamazoo and Pontiac, Michigan school districts revealed that there was an upsurge in white loss coincident in time with the beginning of desegregation (Bosco and Robin, 1974). The impact of desegregation on white flight was greatest in Pontiac. In 1971-1972, the first year of desegregation, there was a

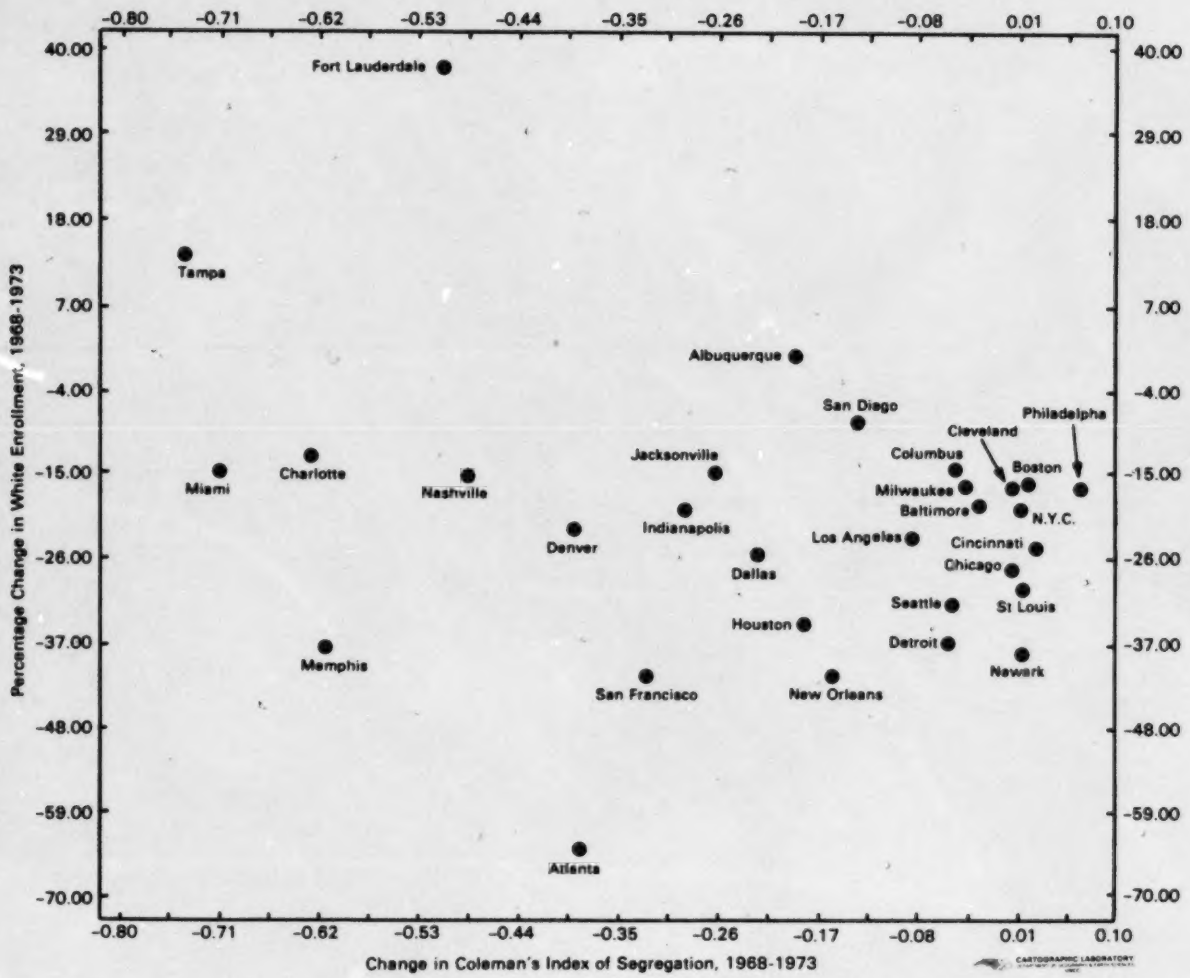

Figure 23. Change in White Enrollment and Segregation in Urban School Districts, 1968-1973 (Source: Adapted from Pettigrew and Green, 1976).

20.8 percent decline in the number of white elementary students, whereas during the five years preceding desegregation the decline had not exceeded 7.5 percent.

Although it is true that in many school districts white loss was accelerated by desegregation actions, it is equally true that in many cases the white loss was relatively short-term. It appears that many of those who leave the public school system do so in the first couple of years after desegregation. For example, in Pontiac white losses after the first year of desegregation were no larger than in the years preceding desegregation. Figure 22 indicates a short-term effect of white flight to private schools in Mississippi. Private school enrollments stabilized after the second year of desegregation. Although a similar pattern is repeated in many other school districts as well, there are some school districts where the impact may be quite large and last more than just one or two years. Such may well be the case in Richmond and Memphis, both of which have undergone large-scale desegregation during the 1970's (see Figure 11 for the trends in white enrollment for Richmond). Although Memphis implemented desegregation in the middle of the 1972-1973 school year, white losses had begun to occur earlier in anticipation of desegregation and busing, especially after the 1971 *Swann* decision upheld the use of busing (Figure 24). But the largest loss of whites occurred between January 1973 and the start of the 1973-1974 school year in Fall 1973. Between Fall 1972 and Fall 1973, white enrollment in Memphis public schools dropped from 55,000 to 35,000 (Task Force on Education, 1975). This loss caused the white proportion in the school district to decrease from 42.3 percent to 32.0 percent in one year. Cases such as Memphis and Richmond will provide stern tests of whether white losses will stabilize.

The Richmond and Memphis cases point to another important factor that influences the magnitude of white flight, i.e., the black ratio in the schools or school district. Both of these school districts were already majority black before desegregation began. This author suggests that there is a positive correlation between the amount of white flight and the black ratio of the school district.

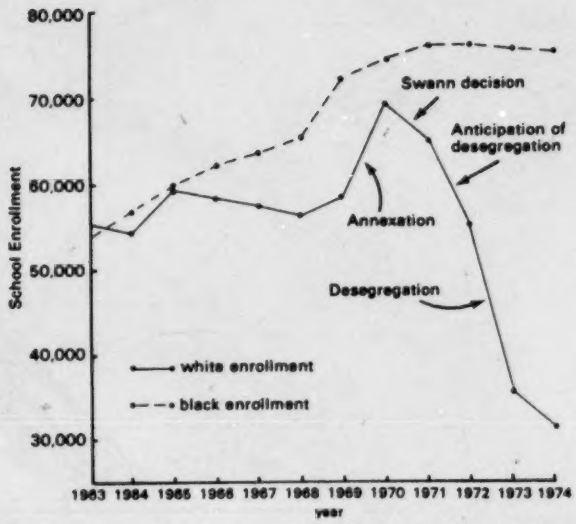

Figure 24. Enrollment Trends in the Memphis Public School District, 1963-1974 (Source: Task Force on Education, 1975).

We discussed earlier the relationship between school desegregation resistance and the black proportion in the population. The evidence seems to indicate also that this variable is one of the most significant co-variants of white flight as well, and the reasons are much the same as those presented earlier. Most researchers, even those who disagree on the role of desegregation in producing white flight, agree that white losses are greatest in districts containing large proportions of blacks. No doubt a high black proportion in the population is associated with other factors that lead to white migration, such as older housing stock and high real estate taxes. But it is believed that the black ratio has some independent effect on school desegregation in addition to its role as a surrogate for other factors.

A study of the decisions of white parents in several Florida school districts to remove their children from public schools and enroll them in private schools provides some of the strongest evidence for the impact of the black ratio on white flight (Giles, Gatlin, and Cataldo, 1974, 1975). The study shows that for a given income group the rate of rejection of the public school by white students varied directly with the black ratio in the public school. Also for a given proportion black in a school, the rejection rate varied directly with the income level of the household. The biggest difference or increase in the rejection rate occurred between schools which were less than thirty percent black, as compared to those that were more than thirty percent black.

The question arises as to whether there is a "tipping point" in the black ratio of schools or school districts such that when the schools reach this ratio there is a rapid acceleration of white loss eventually leading to an all black system. Clotfelter has presented in a conceptual manner two forms of the tipping point (Figure 25a and b). One form indicates that when the black ratio reaches some critical value, all whites will leave and the school district will immediately become all black (Figure 25a). The second form envisions some critical black ratio that will effectuate a dramatic shift in the rate of white flight and will result finally in an all black system (Figure 25b). The end result of these two forms is the same, i.e., an all

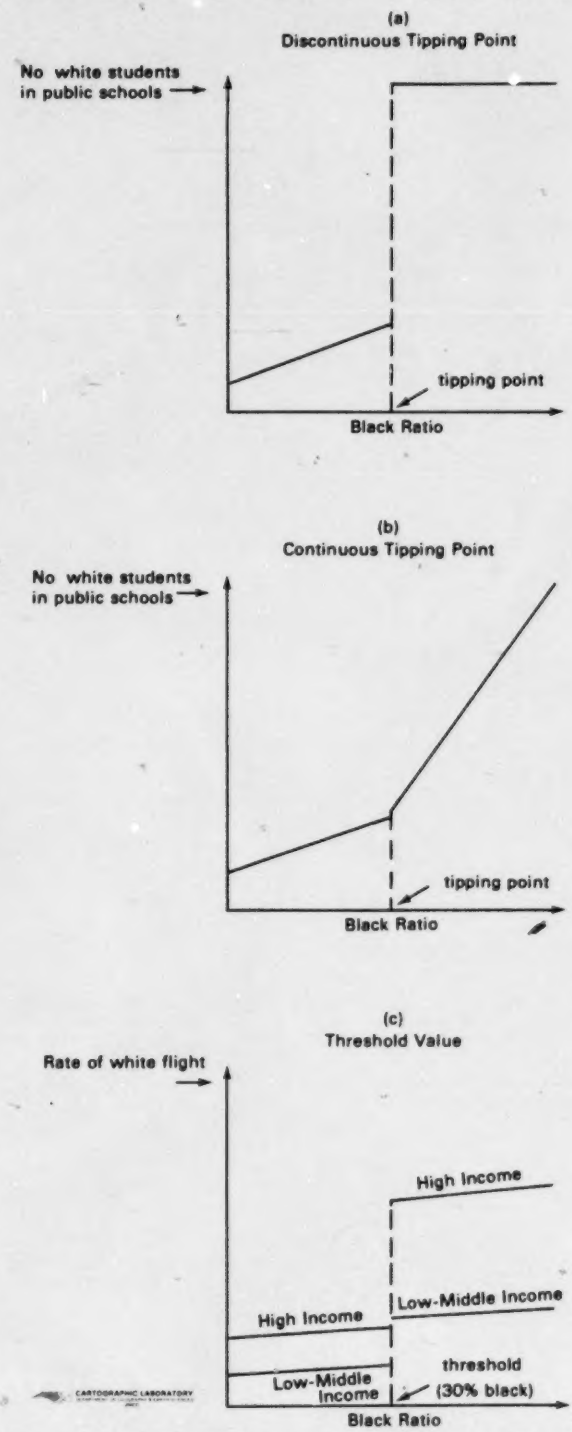

Figure 25. Tipping Point and Threshold Concepts for the Impact of the Black Ratio on White Flight (Source: Adapted from Clotfelter, 1976; Giles, Gatlin, and Cataldo, 1975).

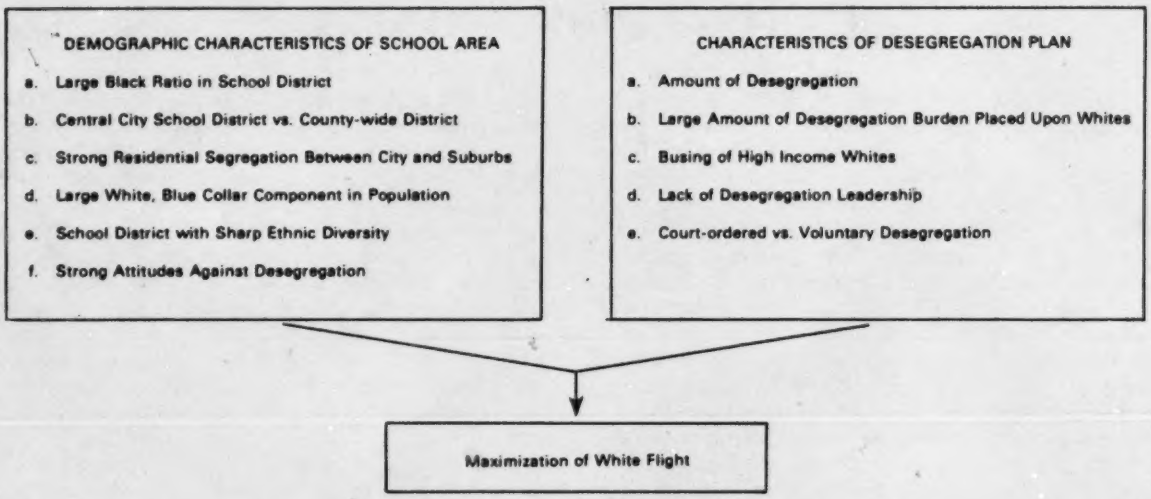
DEMOGRAPHIC CHARACTERISTICS OF SCHOOL AREA
a. Large Black Ratio in School District
b. Central City School District vs. County-wide District
c. Strong Residential Segregation Between City and Suburbs
d. Large White, Blue Collar Component in Population
e. School District with Sharp Ethnic Diversity
f. Strong Attitudes Against Desegregation
CHARACTERISTICS OF DESEGREGATION PLAN
a. Amount of Desegregation
b. Large Amount of Desegregation Burden Placed Upon Whites
c. Busing of High Income Whites
d. Lack of Desegregation Leadership
e. Court-ordered vs. Voluntary Desegregation
Maximization of White Flight

Figure 26. Factors Tending to Maximize White Flight.

black school district. Only the times required to produce the all black system are different.

The tipping point concept in regard to white flight from public schools, just as is the case for neighborhood racial transition, still lacks supportive evidence. Results from the Florida study cited above seem to suggest the existence of a threshold value in terms of the black ratio rather than a tipping point. When the school reaches the threshold value for the black ratio, there is an increase in white flight but not a continuing acceleration of white loss that would lead rapidly to an all black system. The impact of a threshold value for the black ratio is diagrammed in Figure 25c. High-income families are shown to be more likely to reject public schools at all values of the black ratio than lower-income groups, but a threshold of thirty percent black was found to exist for all income groups. However, the impact of the thirty percent black threshold was greater for higher-income households.

Other examples demonstrate the influence of the black ratio on the magnitude of white flight. A comparative analysis of white flight in Pontiac and Kalamazoo revealed that white flight was greater in Pontiac, and it has been suggested that part of the reason for this difference is because Pontiac has a population with a significantly higher black proportion than Kalamazoo (Bosco and Robin, 1974). In Nashville the busing of students from two white neighborhoods to two inner city schools, one which was forty percent black and the other only twenty percent, elicited a larger white flight response from those bused to the school which was forty percent black. Cross-sectional studies of U.S. school districts also have found the black ratio to be positively related to the magnitude of white loss (see Coleman, 1975a; Pettigrew and Green, 1976; Farley, 1975a; Clotfelter, 1976; Munford, 1973; Lowry, 1973).

It also is suggested that whether the school system is a central city district or countywide (metropolitan) affects the white flight response, i.e., one would expect more white flight in a central city system than in one which is countywide. In fact, Pettigrew and Green (1976) have suggested that desegregation has had little or no effect on white flight in metropolitan school districts in the South such as Miami, Jacksonville, Tampa, Nashville, Charlotte, and Fort Lauderdale, all of which experienced a high degree of desegregation. Although white losses in these school districts have not been of the same magnitude as experienced in districts like Memphis, Atlanta, Richmond, and Boston, the losses have been large enough to be considered significant. Both Dade County (Miami) and Duval County (Jacksonville) lost more than 10,000 public school students following desegregation, whereas Mecklenburg County (Charlotte) lost approximately 6,000 students.

White flight occurs less in metropolitan districts than in districts restricted to central city boundaries, partly because the residential migration form of white flight in a countywide district involves moving greater distances to avoid desegregation and busing, i.e., one must move not only out of the central city but out of the entire county. "Havens" in the suburbs therefore are not as convenient in location to those who oppose desegregation. The greater distance to adjacent counties also may mean a longer commuting distance to a job located in the central city. In an examination of white flight in the twenty largest school districts in the South, a dummy variable which indicated if the school district was a countywide or central city system was as strongly related to white student losses as variables which measured the degree of desegregation and the black ratio of the school district.

Figure 26 summarizes what this author believes to be the factors which maximize the white flight response. Many of these factors have been discussed above. These factors generally fall into two categories: (1) those that reflect demographic characteristics of the school district area, and (2) those that relate directly to the desegregation plan itself. School districts representing the converse of these factors would be expected to have minimal loss of white students.

VI. CONCLUDING REMARKS

The debate over school desegregation and busing remains despite the passage of more than two decades since the *Brown* decision. Well-organized national groups maintain their opposition, especially to the use of busing to achieve desegregation. The National Association for Neighborhood Schools (NANS) is such a group. This organization sees the purpose of court-ordered desegregation to be the improvement of the academic performance of the black child. Citing the lack of evidence in support of the achievement of this goal, they conclude that desegregation and busing have not worked. But here they have confused the conclusions of the 1967 Coleman report, which no doubt was used in some instances as the basis for the acceleration of governmental actions for desegregation, with the constitutional basis of the 1954 *Brown* decision. Although the stated purpose of NANS is to seek alternatives to busing, one must ask, "What are the realistic alternatives that will provide equal protection of the laws for all students regardless of race?"

The course of school desegregation legislation which began with *Brown* in 1954 continues to meander. Recently the Supreme Court has ruled that Pasadena, California (*Pasadena v. Spangler*, 1976) need not adjust its school attendance zones every year when changes in housing patterns alter the racial makeup of the schools. This decision seems to suggest that school officials are not required to alter patterns they did not cause. But how much change in the racial makeup of schools must occur before attendance boundaries are altered to reduce racial imbalances? Given the rapid pace at which housing patterns can change, one can easily foresee that in racially changing areas of the district schools could quickly become resegregated.

It is hoped that this paper not only has been informative to its readers, but also that it may have sparked interest in various aspects of school desegregation and busing which may not have been discussed in detail here. Many unanswered questions remain. One continuing area of useful inquiry concerns the relationship among school desegregation, busing, and white flight. Although several studies have been conducted on the subject, there is still much to learn. It is important to understand the impact of previous decisions and to use our knowledge about these impacts in future decisions. A more complete knowledge of the desegregation-white flight relationship would allow school officials to assess better the likely effects of alternative desegregation plans and enable them to minimize their disruptive impact on our society.

Another area of research of special interest to many geographers relates to the impact busing has had on the mental maps or images of the city held by both black and white students. The bus ride by many low-income black children from the central city ghetto to the white suburbs and the reverse flow of whites must have substantially influenced their mental maps.

Each school district that has undergone desegregation and busing represents a laboratory of sorts in terms of its experiences. We can learn from those districts which now have a relatively long history of desegregation (districts such as Charlotte, Richmond, Pontiac, and Nashville). Observations of recent desegregation actions in several northern areas reveal many similarities with the reactions and events which transpired in southern cities several years previously. Geographers through their research efforts can provide important insights and analyses of those districts which have desegregated. This information can be valuable to those areas now undergoing desegregation and to those that will do so in the future.

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